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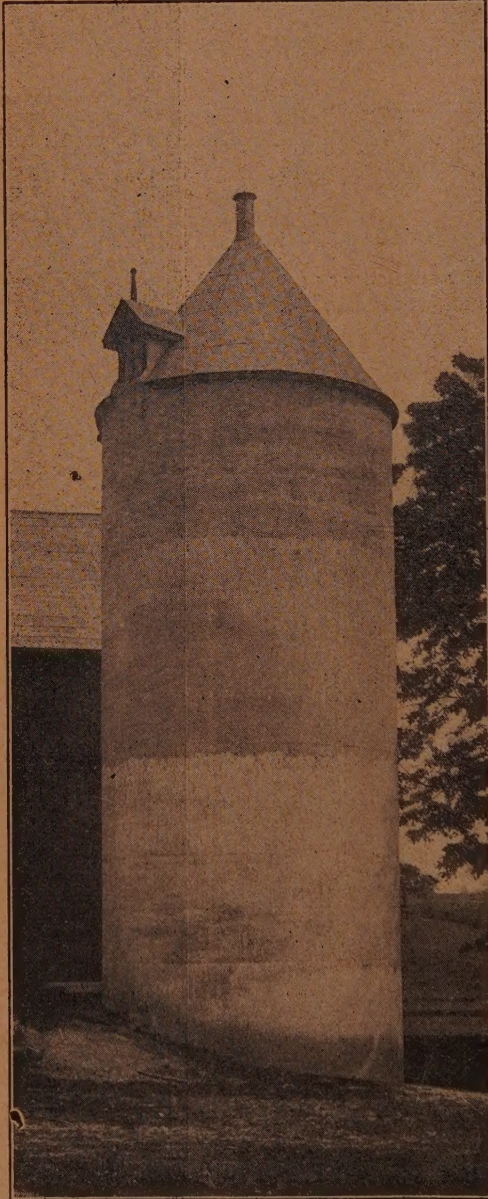
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Special British Columbia Issue



This issue contains practically all of the papers given at the Third Annual Convention of the British Columbia branch of the C.S.T.A., held at Vancouver in March, 1923. One year ago we produced a special British Columbia number of *Scientific Agriculture*, and it was so well received that the policy is being adopted again this year. We are indebted to the Executive of the B.C. branch for splendid co-operation and assistance in making the issue attractive, and it is hoped that local branches in other provinces of Canada will find it possible to present the results of their work to the readers of *Scientific Agriculture* in a similar manner.

It is important to bear in mind, when reading the articles in this issue, that they were prepared seven months ago and, in the case of papers dealing with experimental work, the results have in some cases been extended. Anyone who desires further particulars upon any special article should communicate direct with the author.

On the following page we have reproduced a group photograph taken in Vancouver at the time of the Convention mentioned above. This does not indicate the attendance at the meetings, but is fairly representative. Agriculturists in other provinces will find a number of their co-workers in this group.

Technical agriculturists in British Columbia are very thoroughly organized, the local branch containing about seventy members. While most of these are in the service of the University of B.C. and the Provincial Department of Agriculture, and are stationed at Vancouver and Victoria, there are a number at inland points.

British Columbia members have played an important part in the development of the C. S. T. A. as a national body. F. E. Buck, now President of the B. C. local, was one of the original Organizing Committee which was located at Ottawa during the winter of 1919-20. L. S. Klinck, President of the University of British Columbia, was the first President of the C.S.T.A., and occupied that position from June, 1920 until June, 1922. He is now Chairman of a standing committee on Agricultural and Educational Policies. P. A. Boving was chairman of the first Constitution Committee which drew up the Constitution and By-laws of the Society—these, with a few minor amendments, are still in effect. The branch has always been well represented at Dominion Conventions, and has contributed in many ways to the operating policies of the parent body. This issue of *Scientific Agriculture* is its latest contribution.



3rd Annual Convention B.C. Branch C.S.T.A. Vancouver Mar. 22-23, 1923

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Some Steps in the Evolution of the Marketing Problem.

F. M. CLEMENT

Dean of the Faculty of Agriculture, University of British Columbia.

As you all know, Adam Smith has been called the father of Political Economy, and has possibly had as great an influence on economic thought as any other man. His treatment of the Division of Labour has been considered a classic. Division of labour was a means of increasing the productivity of labour; it implied greater skill, greater dexterity and consequently greater efficiency in industry. But division of labour could not be applied to agriculture; consequently in the rapid progress and development of industry and business agriculture must lag behind. How correct this deduction may be is open to discussion.

We have division of labour to-day by: (1) occupations, such as carpenters, lawyers, farmers, and even such as surgeons and ear, eye, nose and throat specialists in the medical professions; (2) stages in production, such as (a) the growing of wheat, (b) the milling of wheat into flour and (c) the making of flour into bread; (3) where the productive process is divided up into minute parts such as in a meat packing industry, "the animal is surveyed and laid off like a map and the men are classified into over thirty specialties and twenty or more rates of pay, according to the fineness or delicacy with which the task must be performed."

Division of labour in agriculture takes on a distinct form. It is more a question of division by occupations than a question of division into small single tasks at which a man becomes automatically expert as is the case in industry. We recognize to-day as specialists, small fruit men, truck men, tree fruit men, poultry men, dairy men, cattle men, grain men, and some others. It is a division of labour as compared to the self-sufficing period of fifty to one hundred years ago in America when a man produced primarily for himself, and to satisfy the wants of his family. A large portion of goods to satisfy his wants, such as they were at that

time, were produced locally. Some of us here to-day will remember the village tanner, the shoe-maker, the wagon-maker and the home spinning wheel and knitting machine.

Let us now consider in a single paragraph another modern institution, the question of exchange. It is interesting to note how little of the wealth of the world is produced for the personal consumption of the producer. The harvests in the granaries, the clothes in the workshops, the shoes in the factories, the bread at the bakers, the apples in the packing houses are all produced for sale or for exchange. Even our professional men render service for some one else. Does the doctor treat his own ailment or the lawyer plead his own case? Not always, but he renders the service to someone else. It is interesting to note also that exchange, far from being instinctive to primitive man, seems to have been repugnant to him. Primitive man regarded his products as a part of himself. Even donation seems to have preceded exchange. Reciprocal gifts, from man to man, seem to have been the origin of exchange. The gifts were supposedly of equal value or satisfied wants of equal intensity. How far we have departed from this in our modern system of exchange and money economy when the original producer of an article knows not who or where the final consumer is likely to be! Exchange of produce in our modern economy is absolutely impersonal. We produce for a market, not for an individual.

The analogy between agriculture and industry may have been more acceptable to some of us had the speaker referred to the concentration or centralization of industry due to certain natural advantages for agricultural production rather than to a division of labour by occupations. The principal point, however, is that there is a very marked

tendency to specialization in industry, and with it we have as a corollary the whole question of exchange, including the ratio of exchange as it modifies from day to day, week to week and year to year between the products we have to sell and those we have to buy. According to the Report of the Joint Commission of Agricultural Enquiry at the House of Representatives, Washington, 1921—"Measured in terms of purchasing power the farmer's dollar in 1920 was worth 89 cents. In May 1921 it was worth 77 cents. During the past 12 months (i.e. 1921-22) it has been worth less than in any preceding 12 months in 30 years". The cause of this is not by any means entirely due to the disruption of the marketing system. It is in part due to the generally disorganized condition of agriculture as a whole. The time has come when the farmer must consider relative exchange values or perhaps I should say ratios of exchange. He is a part and parcel of a vast economic structure from which he could not detach himself if he would. He has become, or is becoming, a specialized individual mainly interested in one division of employment primarily. He has come to the point where he must live on the profits of his farming rather than on the product of his farm. In the opinion of the speaker general farming is but a step in the evolution of the agricultural industry.

What has been called the industrial revolution in England and by some the industrial evolution in America has been accompanied by certain phenomena that are peculiar to modern industry. The concentration of capital under one head or one executive is a striking feature. Along with this we have the organization of working men for purposes of collective bargaining. It is interesting to note that in the steel industry between 1849 and 1909 the number of wage earners increased 8 times while the capital increased 48 times and the output 47 times. In the boot and shoe business between 1879 and 1909 the number of producing plants decreased from 2,347 to 1,918, but the number of wage earners doubled, the capital increased six-fold and the output $3\frac{1}{2}$ times. (Please note the increased efficiency due to centralized control.) Power driven machinery has taken the place of the hand tool;

production and control are being concentrated while the small units are disappearing; capital is being used on a large scale—very often subscribed by hundreds of small investors. These small investors purchase stock in the larger company rather than use their capital productively in small enterprises managed by themselves.

The use of money and credit economy has become highly developed. Products have become standardized, and merchandising systems have superseded dumping as a means of sale. All this has happened while agriculture has to a large degree remained stationary in its economic organization as an industry. The reasons for this may be sought in many directions. Perhaps one grave error is to be found in the organization of the earlier Agricultural Colleges (or State and Provincial Universities of America) in that agriculture was a something to be set aside and apart from the educational, social, economic and business life of the community. Perhaps another is to be found in the fact that economists following the lead of Adam Smith, Ricardo, John Stuart Mill and others, considered agriculture as something simple, needing little analysis, and suitable only for purposes of illustration when explaining the complications of organized industry. Perhaps the teachings of the classical colleges had something to do with it as indeed even to-day in our own University we have some reflection of the lack of knowledge of the agricultural industry. In discussion with a person, in close connection with the University, about the possible career of a very brilliant student in agriculture, a boy who is already being recognized as a leader—my friend made the remark "Is it not a pity that such a boy should go in for agriculture?" In spite of all this, during the last 15 to 20 years particularly, some very capable men have been devoting their time to studies of, and many researches into, some of the economic aspects of agriculture with a result that we are beginning to feel the weight of educational influence for the organization of men, the concentration of capital and the combination and standardization of products for purposes of sale in agriculture, according to the same principles that have been found useful in industry and business. Industrial-

ism has segregated groups; groups have taken the place of individuals, and we now recognize as a first principle that the first purpose of any group is to secure equality of bargaining power. Only equals can bargain equally, and "liberty of contract begins when there is equality of bargaining power."

It has very often been argued that the organization of the farmer would give him more or less monopolistic control of the price of his product. Without attempting to define what is monopoly or what is not monopoly, it is well to consider first the position of the individual producing plant, which is the farmer and his farm, in the so-called monopolistic farmers' organizations. The guiding principle in this case I feel is illustrated in the law of inertia of large numbers. Thus the amount of wheat produced in any one locality, or any one country, from year to year may vary immensely, but the total world's production remains relatively constant. While the production is high in one district it is low in another. Price varies from year to year, but much more than total production varies. The individual farmer, by scientific cultural methods, may do much to stabilize his yield, but he cannot control the sunshine and the showers, nor can he control the winds and the floods. To quite a large degree he is at the mercy of the elements as an individual, but in spite of this, world's production from year to year remains practically constant. (This statement does not preclude the possibility of change with the passage of time.) The problem of the individual farmer then is to grow his crops as efficiently as a calculated price seems to warrant; to gauge his intensity of culture according to the land, labour and capital at his disposal, and then as an individual take his chance for the year on obtaining a high yield or a low yield and receiving for it a high price or a low price, depending on world conditions. His specific and local marketing problem in this case, as you all undoubtedly have guessed, is, by combination and collective bargaining, by the use of the same methods as are common to industry, to obtain as large a share as possible of the price that is finally paid for the article; or in other words, by narrowing the marketing margin obtain a larger share of the consumer's dollar, or by narrowing

the marketing margin to a still greater degree when he has a large supply locally, reduce the price to the consumer in order that consumption may increase, and in the end give him the greatest total amount of money rather than the highest possible price per unit of product.

It has been argued many times that the farmer, or a farmer's organization, should control the supply, and by so doing permit to flow to market only a sufficient quantity to maintain a price. Fortunately such a condition cannot possibly obtain. Even a small quantity over and above normal demand will greatly influence price. Gregory King has estimated that a deficiency of one-tenth will increase the price three-tenths, and that a deficiency of two-tenths will increase the price eight-tenths. The same law applies to surpluses. Excess production therefore, unless absorbed by exports, tends to depress the price in much the same ratio. Why not then admit that in a given locality it is not generally possible to maintain the margin of variation in production within one-tenth of normal, and consequently the farmer's organization cannot control price when supply cannot be controlled?

You will see then that from the point of view of the speaker there are two main points: First from the point of view of the national interest to increase or equalize the exchange ratio of the farmer's dollar so that the remuneration for labour and capital will be as great in agriculture as it is in industry, and second, from the point of view of the individual farmer, who, by organization, attempts to get as large a share as possible of the consumer's dollar. The first problem is rarely discussed, or possibly I would be more nearly correct did I say it is a topic that is carefully avoided by our business statesmen and is never given prominence by immigration officials. The approach to a solution of it seems to lie somewhere in legalized combination. The second problem is the problem of the individual and the local leader. The first, i.e., the value of the farmer's dollar, is the problem of a statesman.

We are sometimes asked concerning our local organizations "What then is to be the outcome of all this organization and consequent giving to the farmer a larger share of the consumer's dollar?" Is this the solu-

tion of the problem? Before attempting to answer it might be just as well to consider the various steps in the evolution of such conditions as indicated above. Assuming that economists are correct as we believe them to be, wages are the return for labour, interest is the return for the use of capital (capital is here used in the sense of capital goods such as cows, barns and implements), rent is the return from land (rent is here used in the sense of economic rent), and profits are the return from, or payment for, managerial ability. When a man has inherited land, or has homesteaded it or has purchased it for a pittance and then waited for a community to grow up around him, he does not ordinarily calculate that a certain part of his income may be due to the economic rent, that is to certain qualities in the soil or to the proximity to market or to a marketing association in which he has as an individual shown little or no interest. In a practical sense we say a farmer is making money and then value his land at from three to four hundred dollars an acre without stopping to consider the reason for this supposed increase in value. But let a new comer purchase this farm at the higher valuation and what happens? He has capitalized in the land the advantages of proximity to market or the efficiency of the sales organization, and having to pay interest on the new capitalization at once finds that his net returns per year are much less than those of the first owner who did not have to pay interest on a heavy capitalization. In other words, over a period of years, as new comers purchase land at enhanced prices due to the proximity of an efficient marketing organization, the advantages of the organization are to a very large degree absorbed by interest which must be paid to the first or former owner of the land. This problem is current with us to-day as exemplified by the thousand dollar an acre land in the Okanagan. Well might the question be asked "Who then benefits from the organization?" In the final analysis it would seem to be the man who is in a position to absorb the economic rent annually, either the landlord or the money lender. How then is the new comer to live? He of course has still left the wages of labour, the interest on capital and the profits on managerial ability on

which to draw in order to maintain his standard of living. In a further analysis it would seem that the first part of his income should be credited to his wage account, as payment for his labour. A second part of his income might be set aside as interest on his capital, and the balance would represent an amount on account of salary as manager.

In the price-fixing committee for wheat during the war the price of wheat was fixed at a point where it was estimated that it was sufficiently high to keep the supply forthcoming and possibly increase it somewhat. Theoretically this price did not represent the average cost of production, but the cost of production of the man who was representative of about the fifteenth or sixteenth man in a hundred. That is about fifteen per cent of the wheat men would be producing at a loss whereas the remaining 85 per cent. would be producing at cost or at something less than cost. On such a basis the wheat area extended somewhat. It would seem that we must assume that about fifteen per cent of our farmers must ever produce at a loss or must live possibly by the exploitation of their wives and families, while of the remaining 85 per cent a few make wages, some make wages and interest, and some, about twenty per cent in all, make something on managerial ability as well. The next step in the attack on the problem would seem to be a more extended education, a greater technical knowledge and a prolonged experience in order that the man on the land by efficient productive methods may get his cost of production within the sale price, which price is however sufficiently high to keep the supply of the particular product forthcoming. It is now a question of efficiency of production rather than quantity production, and an ideal for British Columbia would seem to be, if possible, to extend the realms of education and information so that our efficiency as a producing body of farmers would be such as to permit successful competition in world markets. To do so our educational and technical efficiency must be equal to that of the most efficient of our competitors. Co-operative organization or combination alone will not solve the problem. Productive efficiency is the goal; co-operative organization is only a step in the evolution of the marketing problem.

The Influence of the Western Grain Movement on the Development of British Columbia.

R. McKEE,

Managing Director, Canada Grain Export Company, Vancouver.

At the outset I am free to confess the subject is a large one and difficult to cover properly in the time at my disposal. The influences of the western grain movement are so general and far-reaching that I shall of necessity confine my remarks to the effect of the movement on certain important phases of our everyday life in this province.

Possibly the most important influence will be the intangible psychological effect on the minds of the people as a whole. Of recent date much "front page" newspaper space has been devoted to the wonderful advantages to be derived by this province in general and the city of Vancouver in particular when the western grain movement shall have become fully developed.

It is but natural therefore that as the dreams of the past develop into realities, a feeling of optimism and confidence in the future will extend to the masses of the people and bring about results far beyond my powers of description and doubtless also beyond my perception. The psychological effect is therefore the first influence and this influence will undoubtedly be a real force well in advance of the maximum development of the grain movement itself. Indeed it is a conservative statement to say that the psychological effect of the moderate progress already made in connection with the western movement of grain has been an important factor in creating the better business conditions which we now enjoy.

Turning now to the more tangible and direct influence of the western grain movement, its bearing on the agricultural situation will naturally be of paramount interest to the members of your Society. I have given much thought and study to this very question and it is my considered opinion that the benefits which will accrue to those engaged in agricultural pursuits in this province will be largely of an indirect nature.

I presume most of you are familiar in a general way with the several grain-producing districts of British Columbia. I take it for granted also that you do not expect me to tell you that this province will one day be a large exporter of locally grown grain. It is true there are certain districts in British Columbia where oats of the highest quality are produced but the area of such production is of limited extent and the land, for the most part, is too high in value to make grain production profitable in competition with grain from the neighboring province of Alberta, where the cost of production is much lower.

Wheat is also being grown to a limited extent in the interior of the province, but the quality is not by any means first class for milling purposes; in fact very little of it can safely be used in the manufacture of flour when such flour would require to compete with the Alberta product. I think therefore we may dismiss from our minds any hope that the western movement of grain is likely to encourage its further production in this province.

It has been frequently stated that the live stock branch of Agriculture would benefit greatly by the development of the western grain movement, in that flour mills of large capacity would be established here and the by-products—bran and shorts—would be available for feeding purposes at attractive prices. I think this is a very mistaken idea, as in my opinion it is most unlikely that we shall ever be a factor in flour production. Here are a few reasons for such an opinion:

1. The domestic market available is too small in population and circumscribed in area as, of course, flour and mill by-products could not be shipped a single mile eastward without a disadvantage in freight rate compared with Alberta mills.

2. No flour mill in Canada or elsewhere, to the best of my knowledge, has ever operated successfully in the export business exclusively.

3. The two flour mills already in Vancouver find it necessary to export a substantial proportion of their production.

4. A flour mill located here is under the necessity of competing with wheat exporters for supplies of wheat and local situations may frequently arise which would not affect competitive Alberta mills.

In short, a mill located let us say in Calgary has every advantage that would be possessed by a mill at Vancouver and at the same time is not handicapped by any of the disadvantages I have mentioned.

The Live Stock branch of Agriculture will undoubtedly benefit by the availability of large quantities of screenings which will result from the western grain movement and as these screenings are sold at a low price, this should be an important cost-reducing factor to the feeder of live stock. Undoubtedly also, facilities will ultimately be available here for the treatment of damp and damaged grain and much feed of this character will be available at low prices.

Bearing in mind the fact that our British Columbia farmers cannot now compete profitably with Alberta farmers in the production of grain; bearing in mind also that this is so notwithstanding the existing excessive freight rates from Alberta to British Columbia, it seems clear that when the freight rates shall have been reduced to approximately where they should be, the British Columbia farmer will find it necessary to employ his land for purposes other than grain-production. No doubt the Poultry Industry in British Columbia will develop to a marked degree under the stimulus of cheap feed and favorable climate conditions.

Let us now consider the influence of the western grain movement on shipping. British Columbia is a maritime province and Vancouver as her chief port has one of the finest natural harbors in the world. The exportation of more grain means that more ships will come to Vancouver. Those ships will buy supplies here. Their crews, when on shore, will spend money in our shops. More coal will be purchased in British Columbia—thus giving employment to more miners. When our drydock is available large

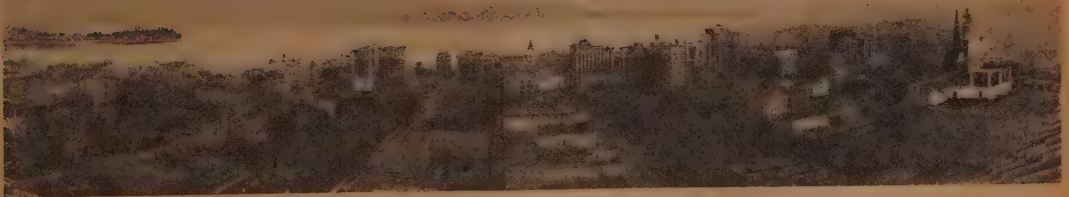
sums will be spent here for repairs. Each grain ship uses large quantities of British Columbia lumber in fitting up to carry grain and many carpenters are steadily employed in this work. It is difficult to estimate the average expenditure per steamer calling here for cargo, as this varies according to size of crew and length of voyage, also the nature and extent of repairs and supplies required, but I should fix the average at not less than \$4,000 aside altogether from the cost of fuel. Let us consider, on this basis, what the mere doubling of our present exports of grain alone would mean in expenditures in the port of Vancouver. It is believed that the exports of wheat (and flour in terms of wheat) via Vancouver this season will reach 20 million bushels, or approximately 600,000 short tons. The average ship will take 6,000 tons of wheat and flour. Therefore 100 steamers would be required to carry our current season's shipments if none other cargo than grain or flour were available. In actual practice, however, other cargo, particularly lumber, salmon and pulp, is available and the average quantity of grain and flour taken by an ocean steamer from this port probably does not exceed 3000 tons. On this basis, which I consider conservative, 200 steamers will be employed in handling our present output of export grain and flour. Those steamers at \$4000 each will expend here for all purposes other than fuel supplies a total of \$800,000.00. As to expenditures for fuel, I have made a careful investigation of this feature and after making allowance for a certain percentage of steamers which do their bunkering elsewhere or burn fuel oil, I would place the average expenditure for B.C. coal at \$2000 per steamer, or a total for the 200 steamers of \$400,000. The present season's shipping expenditure will accordingly total approximately \$1,200,000, or at the rate of \$100,000 per month.

Let us assume that for the next season our present grain storage and handling facilities will be doubled, which I have no doubt will be the case. It may be expected in such an event that our shipments will reach the handsome total of 40,000,000 bushels. The shipping required to handle this quantity will be approximately double the quantity handled this season, or in terms of dollars, the increase in grain and flour exports will mean

an expenditure in this port and vicinity of \$1,200,000, or a total anticipated expenditure next season of roughly \$2,400,000, or \$200,000 per month. You will agree that this large sum of money expended in our province must be of vital importance to every one.

So much for the direct expenditures of money by the increased shipping which will be attracted to this port to cope with our development of the westward movement of grain and flour for export. The question naturally arises—What cargo will these ships bring to our port? Obviously great development of distribution eastward via this port will be a natural outcome of the increased volume of shipping. Ocean freight rates even now are, generally speaking, no higher from Liverpool or London to Vancouver by direct steamer than from the same ports to New York or Montreal, although the distance is nearly three times as great. Why, then, is so much European merchandise moving as far west as Regina and in some cases Edmonton and Calgary via Montreal and New York? The answer is largely one of rail freight rates. To illustrate this point, I well remember a concrete example which occurred in the normal pre-war year, 1913. The railways were quoting "through" rates from London to Vancouver via the Atlantic seaboard in an effort to hold their profitable "long haul" trans-continental business. It was — to take pickles for instance — cheaper to ship Crosse & Blackwell's pickles

from London to Montreal and thence by rail to Vancouver than to ship a competitive Canadian grade of pickles from Toronto to Vancouver. This, of course, would not be possible to-day as ocean rates are so absurdly low that a carload of pickles could be shipped from London to Vancouver by steamer at a lesser cost than the rail freight on the same car from Vancouver to Calgary. However, we in B.C. have during recent years determined that we must fight for a removal of the unjust freight rate discrimination now retarding and in some cases completely throttling our development. As you are perhaps aware, the matter is now before the Privy Council of Canada for consideration, and if our reasonable demands be granted by that body, the effect will be far beyond the imagination of anyone present and certainly beyond my limited powers of description. With the removal of freight rate discriminations will come the rapid development of our great natural advantages and Vancouver will have earned the title, "The Liverpool of the Pacific". Who can foresee what lies before us at this great western gateway of our Empire? What will it mean to us when the teeming millions in the Orient shall have raised their standard of living to even 50% of our western standards? Truly the imagination is staggered by the mere attempt to forecast our future. And what does this mean to those engaged in agricultural pursuits? Surely there can be but one answer: Happiness and Prosperity.



Vancouver Harbour—The Gateway to the Pacific.

The Relation of the Laboratory to the Field.

By P. A. BOVING

Professor of Agronomy, University of British Columbia.

"Can we draw a distinction between the laboratory and the field?"

"Is not the agricultural field itself one great, big laboratory from beginning to end?"

To this I would like to say that the many and great misconceptions regarding agriculture generally have been caused, in no small measure, by the acceptance of these premises; and that they are closely related to the fact that the public at large, and many would-be agriculturists, have answered those questions in the affirmative.

It may be taken for absolutely granted, I trust, that everybody realizes the necessity for laboratory work, so well expressed at one time by Lord Kelvin when he stated: "I often say that when you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thought advanced to the stage of sciences."

Laboratory work—including that of an investigational, as well as of a research nature—has already brought together a very large body of facts, or quasi facts, which have been placed on record. In some instances such records have been collected and systematized and are consequently available. But in many instances the task of keeping track of the results obtained by the laboratory man has proved an almost insurmountable difficulty.

It is a gratifying sign of the times that recent years have witnessed a marked improvement in this respect, and that the investigator, i.e., the laboratory man, shows a growing disposition to seek a rational interpretation of his observations in the light of known scientific principles. It is equally gratifying to find that the field man, be he

a teacher, a district representative, or a practical farmer, is beginning more and more to seek and rely upon the findings of the laboratory man. The recent and decided rapprochement between the laboratory and the field, too often treated in practice as distinct departments, is undoubtedly a stride in the right direction.

But while it is true that conditions have improved, and I for one have been happy to note the change of the general conception in these matters, we must in all fairness admit that things are not as far advanced as we should like to see them. With the growth of our knowledge in various fields, with all the help of all the sciences touching upon our own, it is yet evident, I think, that the agriculturists of to-day have little reason to be in a self-satisfied or exultant mood.

The injury which was caused by the lack of co-ordination, of correlation and collaboration, has been too deep-seated to permit of rapid healing, and what contented a past generation calls for re-enquiry to-day. Right here we touch upon a question regarding which a certain confusion of thought often exists, even though it must be admitted that some of the men in the outside and inside laboratories have made and are making an honest attempt to give a rational interpretation of their findings. Technical terms are of course necessary, but language is only intended to conceal thought in politics. In science, including our own, if the language be unintelligible, it may be that the thought is not clear. I have sometimes thought that one test of greatness in works of art (music, painting, sculpture, and poetry) is whether or not they make a direct appeal to those whose powers of appreciation are not specialized and even to the quite simple intelligence. In the same way if a discovery in the laboratory is fundamental and far reaching, I should expect that its wrappings, or should I call it decorations, of technicalities could be cast aside and that its meaning as

well as its importance could be made reasonably clear to an ordinary intelligent person.

The fact should not be overlooked that the laboratory has a decided advantage over the field. To the investigator it is open to choose any one of several methods or conceptions which best suits his personal idiosyncrasy, but such a choice is not open to the field man, particularly to the teacher or the district representative. He must choose the method or conception which is most easily understood by his students or constituency, and is at the same time least likely to lead to misconception.

With all that I have said so far, I have intended, though I may not have succeeded, to plead for an even more intimate collaboration between the laboratory and the field—between the research men, the investigators and the field men—hopeful that as progress in the past has come through the labours of men of wide sympathies, so in the future when studies are bound to become more specialized, there will be no narrowing of interests. This will mean that the various problems which have to be solved will be attacked from all points of view, and that more light will be thrown upon the mountain side of Agriculture, enabling us all to surmount more easily the peaks of difficulties with which our science is confronted.

All this would be out of place did I not have a more tangible proposal to put before you. I have such a proposal, and stated briefly it is this: *that the C.S.T.A. either as a body or through its branches, publish every year an Agricultural Calendar in which the most outstanding facts and findings of the laboratory have been stated and properly interpreted for the benefit of the field.*

Is this all?—shall we merely have another publication?—Are not the book market and the mail constantly flooded with more or less valuable works read only by a very small percentage of the farming population? Have not our shelves been loaded down with textbooks, bulletin cases and references of various contents?

Do we need anything more of that kind? Possibly not, and certainly not, if the brain of each man possessed the capacity of recording and registering everything of im-

portance that he comes across during his reading. It must be remembered, however, that while a few, very few, laboratory men have the time and opportunity to study and absorb all the different publications issued in their own particular line, it is impossible for the majority of field men to “keep up with the times.” I claim that it would be of great assistance to the average man in the field if he had at hand a ready reference book, revised from year to year, in which he could find the most reliable and up-to-date facts regarding various phases of agricultural science, practice and information.

It would be impossible, even if it were not out of place, to attempt to review in detail the important work of all the different factions of agriculture. In the present age of specialization and rapid publication it would be impossible, for me at least, to give a connected account of recent developments in Agronomy alone, without spending a greater amount of free time than I have at my disposal.

The appropriate alternative is to touch upon some questions, each sufficiently fundamental to be of general interest, and to discuss one or two phases as briefly as it is possible.

When I propose the publication of an agricultural calendar, I do not mean that we should attempt to duplicate any so called “short general textbooks on agriculture”; we have more than enough of books, too often unsatisfactory and unreliable, written by men who have only a limited, or at the best, a rather one-sided knowledge of a few agricultural problems. What we need is a handy publication, in pocket size, containing space for notes of various kinds, besides short articles and tables on important and specific questions pertaining to: General Agricultural Conditions, to Agronomy, Animal Husbandry, Dairying, Horticulture and Poultry with their allied sciences.

It is not for me to decide what range of facts we can admit into the category of positive knowledge. I shall, therefore, content myself with enumerating a few of the more important features of the proposed calendar:

Under *General Topics* we need concise information and statistical data regarding

area, production and value of agricultural products for the Dominion, as well as for each separate province.—Short notes regarding precipitation and climatic conditions would be of great value to the workers in the field and would often be of service to the laboratory man.—The marketing problem is a question, under this section, which has been on the minutes of the C.S.T.A. since its inception. A clear statement by somebody who, like Dean Clement, has spent many a weary laboratory hour investigating this particular and important problem, would assist a great deal in the clearing up of the average, muddled conceptions regarding marketing and co-operation.

The public needs information regarding Dominion, Provincial and College work, and about specialists engaged along various lines.

I shall be even more brief regarding the remaining contents of such a calendar:

In Agronomy the field man repeatedly requires specific information about Soils and Soil Fertility; Irrigation and Drainage; Manure and Fertilizers; Crops and Rates of Seeding; Clover and Grass Mixtures, etc.

Animal Husbandry men and *Veterinarians*, in the laboratory and in the field, would perform an extremely useful service by collaborating regarding such vital topics as: Feeding; Care and Management of Various kinds of Animals; The Rearing of Young Stock; First Aid Remedies; Tuberculosis and Disinfection.

We all realize that as regards *Dairying* more general, as well as specific information and knowledge is needed about: Bacteria; The Cooling of Milk; Cleanliness in the Dairy; and the Home Manufacture of Butter and Cheese.

I feel certain that *Horticulturists* would appreciate ready instruction and handy reference regarding such topics as Fruit Varieties recommended for different districts;

Pruning; and Spraying, to mention only a few problems confronting the grower and the field man.

The *Poultry* men should have a splendid opportunity for hastening the remarkable progress which has already been made along this line by publishing statements about Breeds and Breeding; Feeds and Feeding; Incubation and Brooding.

To pursue the subject further would serve no useful purposes. It would be rash to venture at present more than a most general outline of such a publication.

Two different systems might be adopted, either the book system or the loose-leaf system. For myself I see advantages and disadvantages in both, although I feel inclined to think that there are more advantages connected with the solid book system which requires constant revision.

There is also the question as to whether such a calendar should be published for Canada as a whole or for various districts. In this respect I lean towards the latter alternative, even though I do not consider it absolutely necessary to issue a calendar for each separate province.

With this, I have put a question before you which may be controversial. If so, I sincerely hope that nobody will think for a moment that I have had any intention to arouse controversy.

One of the great functions of our Society is to serve as a popularizing medium between the laboratory and the field. My solution, or should I say my contribution, may not be, and should not be, accepted without thorough consideration and discussion; but it represents at least the result of a fair amount of thought and speculation, as well as some effort, with the object of adding something of value to the other useful work of our Society.

Some Potato Disease Problems in British Columbia

By J. W. EASTHAM.

Provincial Plant Pathologist, Vancouver, B.C.

The potato, like most of our important and long-cultivated crop plants, is subject to a large number of diseases. Some of these are specific diseases which have probably been associated with it since it originated as a species, and have spread with their host wherever climatic conditions have permitted. Late Blight (*Phytophthora infestans*) and Powdery Scab (*Spongospora subterranea*) are probably diseases of this character.

On the other hand the nature of the potato tuber is such that, in all probability, a considerable number of fungi, and bacteria, normally present in the soil as saprophytes on humus and plant debris, can become active tuber parasites bringing about rot. A potato tuber is largely a reservoir of reserve food materials in a network of cellulose walls and protected to a limited extent by a corky external layer.

Some organisms, truly parasitic, can penetrate through the external skin of the tuber, whilst others, semi-parasitic or saprophytic, are only awaiting the opportunity that any slight mechanical injury may give them to reach the soft internal tissue with its food supplies. For this reason the total elimination of disease is something that cannot be hoped for, and the best that can be expected is to keep such diseases down to a point where they do not seriously militate against commercial production.

It is an unfortunate fact that as one disease is brought more or less under control, a new one is discovered or another old one takes on a new importance. There are instances of what appear to be quite specific diseases which have been observed only in recent years. Perhaps the most striking instance of this kind is the Potato Wart or Canker, due to an organism usually known as *Chrysophlyctis endobiotica*. This is one of the most destructive diseases of the potato and of very distinctive appearance. I know of nothing which could be confused with a typical case. Yet this disease was noticed for the first time in 1896 by Schilbersky in

Hungary. Later it was found over most of Western Europe and in 1909 in Newfoundland. One or two cases were found in Eastern Canada about 12 years ago. Vigorous measures were taken for its suppression and there is no record, to my knowledge, of its having reappeared. The United States is now combating an outbreak in Pennsylvania, which has evidently been present since before the potato embargo in 1912, but which was only detected a year or two ago. A case like this is of great theoretical interest. It hardly seems credible that a disease occurring on the potato in its original home should only be detected some 300 years after cultivation of this crop had become fairly common, and that, with the distribution of potatoes all over the world without restriction, except in recent years, it should still be mainly confined to Europe. On the other hand the difference between the causal organism and its nearest relatives is generally considered to be of generic rank. Moreover, it has not been recorded on any host but the potato. It may be that we have here the origin of a new species of parasitic organism, or it may simply mean that the original host and mode of life of an organism now found on the potato, have not been discovered.

Turning now from this more general aspect of disease, I would like to call your attention to a number of problems of more practical importance.

COMMON SCAB

This is found wherever potatoes are grown. At one time it was supposed to be due to mechanical irritation of the skin. In 1890 Thaxter isolated an organism which he proved to be causally related to the disease, and which he considered to be one of the lower fungi, giving it the name *Oospora Scabies*. In 1914 Gussow re-classified it as one of the filamentous bacteria placing it in the genus *Actinomyces* (*A. Scabies*). With the taxonomic validity of the name *Actinomyces* we need not concern ourselves here, and

in fact, the organism is usually known today as *Actinomyces scabies*. In 1914 Lutman and Cunningham brought forward the view that the scab organism is identical with a common and widely distributed soil organism named by Gasperini in 1891 *Actinomyces chromogenus*. While this may be the case, the evidence has not been generally accepted as conclusive and *Actinomyces scabies* appears to be the systematic name usually employed. At this point, however, the problem ceases to be academic and has a distinctly practical bearing.

A system of seed disinfection has been developed, which provided the soil is free from infection, has proved of much value in the control of scab. Occasionally, however, cases are brought to our attention where disinfection has apparently been carefully practiced and virgin soil, or soil that has not previously grown potatoes, used, and still scab has developed to a noticeable extent. Recently I was informed of a case where potatoes had been grown from the seeds (from the seed ball) sown in leaf mould, and scab was present on the tubers. While the observations mentioned are not from experiments planned and controlled in accordance with rigidly scientific methods, they do raise doubts as to the accuracy of our knowledge concerning the distribution of the scab organism. It is not probable that the practical measure of seed disinfection can be discontinued. This is useful against other diseases besides scab. Moreover, even if the scab organisms were shown to be normally present in many types of soils, there would probably still be sufficient benefit gained in reduction of scab to make it worth while. We know that, in almost all cases, a strain of an organism becomes more virulent to one particular host after parasitism on that host, than a strain from some other host, or one that has been living saprophytically. If, however, it can be decisively shown that the organism causing scab is distinct from any organism normally present in the soil, we shall have no loophole left to explain the failures above mentioned, and we shall have to check up more carefully the methods of treatment and the condition of the soil. On the other hand, if it is shown that the scab organism is identical with forms normally present in many soils, then we will

have to expect that, under certain conditions, even a virgin soil planted with disinfected potatoes may give a scabby crop. While the testing of the pathogenicity of the isolated organisms would fall within the sphere of responsibility of the plant pathologist, the isolation of the various actinomyces will probably be left to those working specially on the micro-biology of the soil. The present gap in our knowledge may be partly due to a lack of co-ordination between the two sets of workers.

LATE BLIGHT (*Phytophthora infestans*)

In this case we have a thoroughly effective method of control in the use of copper fungicides applied thoroughly, and sufficiently often, to protect the growing plant, and to prevent that development of the disease through which tuber infection results. The problems connected with this disease in B.C. are therefore more the result of local conditions than of the lack of basic knowledge. Late Blight, so far, has not been recorded from the interior of B.C. This statement not only applies to the so called Dry Belt, where irrigation is absolutely necessary, but also to the Kootenays and the Upper Okanagan. No doubt this is to be explained by the low precipitation during the summer months. While crops may be grown without irrigation, in most cases this is of great value. Even at the Coast the summers are usually comparatively dry. It is noteworthy that in the seasons during which inspection for seed certification has been carried out, no Late Blight has been found in the Courtenay-Comox district nor have we received information leading us to believe that blight epidemics have occurred, although the annual rainfall in this district is probably 48 to 50 inches. This in fact is quite an asset to this district from the point of view of seed production. The lower Fraser Valley appears to be the only part of B.C. liable to Late Blight epidemics and even here they often occur only locally and at intervals of 2 or 3 years. Under the circumstances it is somewhat difficult to persuade the farmer to invest in spraying machinery. Another stimulus to spraying that is missing in B. C. is the Colorado Potato Beetle. When this pest occurs spraying is unavoidable, and if the work has to be done it is little more trouble

to make the applications cover disease as well as insect control. Under the circumstances, therefore, it can probably be understood why there is, so far as I know, only one potato sprayer larger than a hand sprayer in B.C., in addition to the two sprayers owned by Department of Agriculture. There is no doubt that this is to be regretted, as even when the late blight fails to appear, early blight often works considerable damage, while it has been shown by much work in the east that spraying has generally paid for itself with increased yields even if it did not happen to be a blight year. I do not know if this still holds good in view of increased costs of labour and machinery with no corresponding increase in the value of the crop. It would seem to be necessary to carry on demonstration work over a series of years with careful recording of total yields and amount of blight, in order to offer evidence convincing to most growers of the practical value of spraying.

At one time it seemed as though the simplest way to control the disease would be by the use of seed grown in the Dry Belt. Since the disease is carried over, so far as we know, only in the tubers, by planting disease-free tubers throughout a district the disease would be eliminated until reintroduced. No amount of hand selection can ensure the rejection of all diseased tubers if blight has been present in the crop, since a tuber so slightly affected as to escape notice may serve as a focus for the spread of the disease. Tubers from an irrigated section, however, would probably be quite safe. Unfortunately, today, the irrigated potato is not considered to be as good for seed purposes as that grown under natural rainfall conditions; one reason, at any rate, for this change of attitude in recent years will be discussed later.

At present then, we have this situation. Any year we may have an epidemic of blight in the Fraser Valley. The question arises, is there anything the grower can do to diminish the loss from tuber rot? If the market is fairly good and he can sell his crop for immediate consumption it may be best for him to dig his crop as soon as blight hits it severely. Otherwise this is not desirable, since much direct infection of tubers may be brought about during digging. Ordinarily

it is best to wait until the tops have been dead a week or ten days or have dried out, since the conidia will not stand drying. The disposal of the tubers offers the next difficulty. It is undoubtedly best to get rid of them at once, but in a blight year, this may mean a bad slump in the market. Under good storage conditions, with careful selection of the tubers stored, and occasional sorting over during the winter, it may be possible to keep the produce from a blighted field until spring, but when pitted on the field there is often very heavy, or even total, loss, when the pits are opened in spring. It may be possible to improve on the type of pit usually adopted but it is doubtful if any will meet the requirements.

The starch products factory recently opened at New Westminster should prove a great help in enabling the grower to dispose of his crop without undue loss since even blighted tubers are quite satisfactory for starch making.

BLACK SCURF (*Corticium vagum* var. *solani*)

This is still best known by the old name *Rhizoctonia* is probably as ubiquitous a mycelium before the connection between this and the spore-bearing stage was discovered. *Rhizoctonia* is probably as ubiquitous a disease as common scab and much more destructive. At the same time the nature and degree of injury produced are so variable that it is difficult in most cases to estimate the damage done.

"Misses" in the crop, small irregular tubers, yellowing and premature death of the tops may all be due to the presence of the disease. At the same time it appears that, under conditions favorable to the crop, a very considerable amount of *Rhizoctonia*, as shown by the extensive occurrence of sclerotia on the tubers, may be present without apparent serious loss in yield. Probably the lack of evidence of injury in such a case, however, is more apparent than real, since in most cases there is no means of judging what the yield might have been if the *Rhizoctonia* had not been there. Moreover, even in experimental work it is not easy to secure a proper control plot for comparison.

This fungus has a remarkably wide range of host plants, including most of our cultivat-

ed plants except perhaps the cereals. Hence, while keeping the potato crops far apart in the rotation, no doubt helps to reduce the amount of the disease in them, it cannot altogether prevent it. Moreover, the disease can probably live over saprophytically in the humus of the soil.

An important question is the relation of the sclerotia on the seed tubers to the spread of the disease. Where the disease is well established and abundant in the soil the condition of the tubers may make little difference. Bisby, Higham & Groh in a recent number of "*Scientific Agriculture*" give the results of certain experiments in Manitoba when it apparently made no material difference to the result whether the seed tubers were free from Rhizoctonia or not. In these soils the amount of infection from the soil preponderated so greatly that the role of the tuber as carrier was negligible. While this is certainly not always the case, it is nevertheless important to bear it in mind in explaining individual cases.

The relation of the sclerotia on the seed tuber to the development of the disease in the growing crop, assumes an important practical aspect in connection with seed certification. Our regulation at the present time reads as follows, "Not more than 10% of slight rhizoctonia will be allowed. Not more than 3% of severe rhizoctonia will be allowed and no scurf spot larger than $\frac{1}{8}$ inch in diameter. Occasional spots constitute slight rhizoctonia." It is not easy to give exact definitions of slight and severe infestation respectively. The reason for the distinction is that small sclerotia can be effectively killed by seed disinfection with corrosive sublimate while large ones cannot. The centre will remain viable even with prolonged soaking in 1-1000 mercuric chloride. The problem of raising a crop of tubers substantially free from rhizoctonia is therefore an important one for the seed grower. Bisby, in the paper previously mentioned, obtained the interesting result under the conditions stated, that the abundance of sclerotia present on the tubers was largely dependent on the time of digging, varying in one case from 7.5% on August 20th to 93.5% on Oct. 13th.

It does not seem probable, however, that this knowledge, even if found to be generally

true, can be made of practical service. The time of digging the seed crop will be determined largely by other considerations. Moreover, it appeared from further experiments in Manitoba that planting could not be deferred sufficiently to give an effective reduction. A more important point, is this. Proper seed disinfection will prevent the tubers carrying the disease unless large sclerotia are present. A sample of potatoes, therefore, that shows a comparatively high percentage of rhizoctonia may, if so treated, be better seed stock than one that falls within the regulation above given. For instance seed that shows 20% rhizoctonia but which is from a crop free from mosaic and leaf roll would, if disinfected, be preferable to seed from a crop which had just passed inspection as regards mosaic and leaf roll and contained say 5% rhizoctonia.

The aim of seed certification is to make the best possible grade of seed available to the grower. By insisting too strictly on a matter of secondary importance we may be defeating our aim. There is something to be said, therefore, for having a second grade of seed to include tubers which contain more than 10% showing slight rhizoctonia, and possibly also more than 5% with slight scab. The tag for such a grade should emphasize the necessity of such a seed being treated with mercuric chloride.

It may be urged that it would be better to keep to the one grade of seed, and in such cases as that above mentioned, the inspector could give the grower a statement saying that the crop had been rejected only for too high a proportion of rhizoctonia, and that if disinfected, it would be equal to certified seed standard. The sealing of the bag with an official tag, however, is an important contributory factor in maintaining the grade. If a consignment of seed has reached the ultimate user by any route except direct from the grower, the unbroken seal is the only guarantee that the sample is what it is claimed to be. Similarly the system of sealing is a check on the grower himself. On the other hand the effect of introducing an inferior grade of seed even under the conditions mentioned, might be in the end against our best interests. It might affect our reputation adversely, especially outside the province, more than the amount of seed gained could

benefit us. It is a matter, therefore, for discussion and careful consideration.

FUSARIUM WILT.

The wilt fungus may be carried over from year to year in the soil in infected tubers. There is considerable difference of opinion as to the relative importance of these two sources of the disease, but proper seed selection is undoubtedly important. It has long been supposed that there was a definite correlation between the presence of the fungus in the tuber and the discoloration known as "Stem-end browning" or "brown ring". More recent work has shown that this correlation is not reliable. Professor McKay, under Oregon conditions, found that in 12,000 tubers tested, only 45% of those showing the brown ring also showed the presence of a parasitic fungus, while 5% of all tubers examined and showing no discoloration yet harbored the wilt fungus. There is an increasing, and apparently well founded, belief that under irrigated conditions especially, a stem end vascular discoloration may develop independently of any pathogenic organism. Our own observations are in line with these. Mr. Greenwood last year made a considerable number of cultures from potatoes showing stem end browning with mostly negative results. Moreover, we sometimes find considerable browning of the vascular ring in a crop which has shown very little wilt in two field inspections of the growing crop. The question that arises is what value is to be placed upon the presence of vascular ring discoloration in seed certification? The first point to be noticed is that present seed certification standards known to me only allow a very small percentage of stem end discoloration, say 3% to 5%. To this general standard we in British Columbia must conform, at any rate if we look to extending the market for our seed into neighboring provinces and states. Even if more extended work brings confirmation of the above results, British Columbia can only modify its schedule in general accordance with changes brought into effect elsewhere. In the second place a discolored potato is not a desirable one for table purposes, irrespective of the cause of the discoloration. Moreover in any case there is a probability of such a defect being passed on in greater or

less degree to the progeny. For this reason also, it is not advisable to lower the standard much. It is, however, increasingly important to form accurate estimates of wilt during growing crop inspection, both for the sake of guaranteeing the quality of the seed and obtaining additional evidence of the correlation, or want of it, between wilt and brown ring discoloration. It is also increasingly important that a careful examination of each suspected plant be made so that the diagnosis may be reliable. Any tendency on the part of an inspector to think it a waste of time making an accurate estimate of wilt during the growing season, because the estimate can be more easily and definitely made from the tuber inspection, is to be strongly discouraged.

FUSARIUM ROTS.

There is room in British Columbia for a great deal of work on this perplexing group of diseases. So far as our limited observations go they indicate that our two most important rot producing *Fusaria* are *F. coeruleum* and *F. trichothecioides*, the latter being the chief Dry Belt Form. The loss from these rots in storage is often very considerable and appears to me to be on the increase. This increase may be only an apparent one, due to our inspection system giving us closer contact with conditions, but I fear there are reasons why actual increase, in some sections at least, is probable. One of these reasons is the Chinese cultivator. Whatever the merits of the Chinaman as an industrious workman, his ignorance of what we may term the finer points regarding potato cultivation is both extensive and obdurate. I have a very vivid recollection of visiting a farm on Sea Island, leased to Chinamen and seeing a pile of several tons of potatoes rotting with blight, fusarium and almost everything else imaginable, being hauled on the land as manure for a potato crop. The effect of such a procedure is, unfortunately, not limited to that particular crop since some of these organisms may remain in the soil for a long time. The control of the disease under the best of conditions is not always easy. Good storage conditions and the careful elimination of injured tubers prior to storage are essential. Pratt in dealing with *F. trichothecioides* obtained good results from distin-

fecting the tubers with 1-1000 Mercuric chloride or 1 lb. to 30 gals. formaldehyde immediately after digging, just as is done before planting. There might be some objection to the use of such a powerful poison as mercury bichloride, which is absorbed by the skin of the tuber, in the case of a crop destined for consumption. McKay states that in Oregon excellent results have been obtained by the use of formaldehyde at the usual strength of 1 pint to 30 gals. Should this treatment become necessary, however, it will add appreciably to the labour and expense of potato raising.

LEAF ROLL AND MOSAIC

We now come to two diseases of a totally different character which have been a source of great perplexity to plant pathologists. They are leaf roll and mosaic. These diseases are known to be transmissible from plant to plant during the growing season and from generation to generation in the tubers. At the same time no fungus or bacterial organism has been causally connected with them. The tendency recently has been to regard them as due to ultramicroscopic organisms and they have been termed *Virus* diseases. At the last meeting of the American Association for the Advancement of Science, however, evidence was produced to show that they were due to protozoa present in the sieve tubes, one form at least being very similar to a trypanosome. As regards leaf roll in the Province there have been certain quite severe and unmistakeable cases, but on the whole there is not a great deal of it as compared with Eastern Canada. It is quite possible that even some of what we are putting down as such may be something else, for the symptoms are not always easily recognized except when pronounced. Last summer, for instance, in the Invermere district, I saw a field where the outer rows,

and these only, had been flooded early in the season. In these what appeared to be leaf roll was quite well marked, but in the rest of the field it was not noticeable. It might be that a latent condition of leaf roll had become evident where certain conditions favored it, whilst it still remained masked in the rest of the field. The form of net necrosis distinct from frost necrosis of the tuber, is now supposed to be connected with leaf roll, and it is in keeping with my estimate of leaf roll that true net necrosis is relatively uncommon in the province.

Mr. R. G. Newton, the Superintendent of the Dominion Experimental Farm at Invermere states that he has been able to almost eliminate leaf roll by sprouting the seed tubers before planting and rejecting all that show weak sprouts. Certainly I can testify to the scarcity of leaf roll plants in the potato plots on the Experimental Farm, although there is an abundance of it in the surrounding district.

Mosaic on the other hand is quite common and widespread. The severest cases I have seen have been on Sea Island and Lulu Island. In the interior it is not usually so pronounced. One reason why the irrigated country is no longer considered equal to the natural rainfall belt in the matter of seed production is because it is believed that "mosaic" may be masked or latent under such conditions and develop when the seed is planted elsewhere. The question of the transmission of mosaic from plant to plant in this province is an interesting one. Neither the aphid nor the leaf hopper, which are especially incriminated in the East have been observed on the potato here, except perhaps in the Columbia Valley, but this is only one of the problems presented by this disease which await elucidation.

Farmers' Problems as Recorded by Farm Surveys in British Columbia.

By H. R. HARE

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Dairy farm surveys were inaugurated in British Columbia in 1919 in the Department of Animal Husbandry. Since that time two reports bearing on two years of dairy farm investigations have been published and a third year's work is undergoing the process of compilation.

Though several investigations of a similar nature have been conducted by other Departments of the University of B. C. and though much data is available from many other parts of the world I wish to confine the farmer problems in the present discussion to those that have been met in dairy and general farm surveys as conducted in B.C.

The first year's investigations were made possible by the co-operation of 54 farmers located in the Lower Fraser Valley and on Vancouver Island. The same districts were included in the second year's work along with a number of farms at Salmon Arm and along the Arrow Lakes, making a total of 124 farms. The third year's investigations extended to 195 farms and added a number of farms from the Okanagan Valley.

While there are a comparatively large number of farmers co-operating in this work it is felt that due to the wide range of conditions that exist between districts, a still larger number of farms would make for greater accuracy. The investigations thus far bear upon the crop years of 1919, 1920 and 1921.

During this time the market prices for farmers' produce has steadily declined, as is evidenced by the rate of interest yielded by farm operations after allowing wages to the operators at \$80 per month and crediting the farms with produce used in the house and with operators' house rent. This rate of interest approximated 8% return on capital investment the first year, 5% for the crop year of 1920 and 1.3% for the crop year of 1921.

Butter fat during the three years sold at the following prices, 76, 70, and 51 cents per pound. The great decrease in the selling price during the last year may be accounted for to a small extent by the fact that a large number of farmers were included who sold butter fat to creameries which paid a comparatively lower price for the product than was returned to farmers included in the survey the first two years. Other farm products suffered similarly so that the return to the farmer for his hard work has gradually decreased during the years covered by these investigations.

The successful management of a dairy farm under normal conditions is a problem which demands much skill; particularly its operation for profit during the latter years of these investigations. During the three-year period some farmers have operated at a profit and by a study of these farms many valuable points may be obtained. In spite of this, however, each year has seen a larger percentage of farms which have returned minus labour incomes to their operators.

Returns that farms yield are shown clearly in Table I, at the top of the following page.

This table compiled from the crop year ending May 1st, 1922, groups the farms according to size.

In only one group was it possible to pay interest at 7% and leave anything to the operator as a return for his labour. The larger the farm the greater was the minus labour income with the exception of the 46-70 acre group which is explained by the fact that a much smaller percentage of land was productive and it is probably a difficult size of farm to handle in that it is too large for one man and too small for two men. This would indicate that either the capital per acre or the rate of interest allowed is too high.

TABLE NO. 1.

	TILLABLE ACRES				
	Up to 30	31—45	46—70	70—100	100 and over
Percentage of farm area productive	50	51	42	58	71
Number of farms	31	30	26	27	21
Actual acres	42	73	129	141	213
Average tillable acres	21	37	55	82	151
Labour income allowing interest at 7%	\$+204.	\$-12	\$-449	\$-235	\$-774
“ “ “ “ 3½%	\$+551.	\$+544	\$+365.	\$+582	\$+499
Average capital per farm	\$9375.	\$17,563.	\$22,094.	\$31,279.	\$48,576.
Average capital per tillable acre	\$ 447.	\$475.	\$402.	\$382.	\$315.
Perquisites including house rent	\$ 392.	\$497.	\$506	\$497.	\$607
Rate of interest farm returned					
after deducting \$960 wages	-1.3%	.8%	.09%	1.4%	1.6%
Average farm net revenue	\$+830.	\$1102.	\$979.	\$1390.	\$1773.
Gross receipts	\$1402.	\$2204.	\$2300.	\$3665.	\$5368.
Gross receipts per tillable acre	\$ 66.	\$58.	\$41.	\$44.	\$35.
Interest per tillable acre at 7%	\$31.29	\$33.25	\$28.14	\$26.74	\$22.05

The land values as fixed were based upon current prices at which farms were selling at the time the data were collected. The interest rate may be considered, and is, high but is the prevailing rate asked on farm mortgages in the districts studied. The capital per tillable or productive acre of land is high. This is due to the high price of land and to the fact that all unproductive land is carried by the productive acreage. This productive acreage forms too small a percentage of the total acreage of the farm. This brings out the problem of uncleared land which is a great handicap to profitable agriculture in B. C.

As may be seen in the accompanying table the perquisites or the house rent and farm products have been credited to the farm. In other words out of the farm net revenue the farmer must meet his actual living expenses including the rent of his house, the milk, eggs and potatoes he uses in the house as well as his payments of interest such as may be owing on mortgage or other bills payable.

This last year has been the first year that the perquisites have been recorded but it is only fair to credit the farm with all that it produces; we are then in a position to compare the profits of the farming business with those of other businesses.

A study of the labour incomes on the various sized farms shows that when interest is calculated at 7% the farms of small acreage have the advantage. When the interest is calculated at 3½% there appears little gain for any one size of farm. The farm net revenue is naturally largest on the large farms.

Were the farm operators allowed a wage—of say \$80. per month, out of which they must meet perquisites and other living expenses, the interest returns on capital as shown is low on all sizes of farms but is highest on the largest farms.

It seems difficult for the camel to pass through the eye of the needle, but some farms were successfully operated on all the different acreages.

The size of the farm does not necessarily determine the profit that farms return.

This is determined to a much greater extent by the size of business that is developed upon the acreage operated by the farmer.

It will be noted that the interest charge per tillable acre varies from \$22. to \$33. per acre. The gross receipts for the same areas vary from \$35. to \$66. per acre. To overcome this high interest rate a large receipt per acre must be economically obtained in

order to overcome this handicap. A large sized dairy farm business operated economically is profitable in B.C. Many factors contribute to such an organization but time

will permit of the discussion of only a few of these. The production per cow is one which influences returns greatly as is indicated by the following table:

TABLE NO. 2

Production per Cow.	No. of farms	Average lbs. B.F. production per cow	Farm net revenue \$	Labour Income allowing interest \$		Cost of Feed per cow. \$	T.D.N. required for 1 lb. B.F.	Percent farms with P.B. sire
				at 7%	at 3½%			
Up to 200 lbs.....	43	161	869	-445	240	56	21	63
200-250 lbs.....	35	228	1131	-327	401	66	16	77
251-300 lbs.....	38	273	1539	-137	828	66	13	87
301 lbs. and over.....	18	354	1785	+435	1110	72	11	94

Only those farmers whose cows averaged over 300 lbs. of butter fat per year show a plus labour income when interest is calculated at 7% on capital invested. Fortunately, it is not necessary for all farmers to meet this heavy interest payment as most of the farms are owned wholly or in part by the operators. To be a profitable business, however, it should be such that it would be possible to make the payment if necessary.

The average production of butter fat per cow for the year ending May 1st, 1921 was 235 lbs. If this butter fat was produced in 3.75% milk it would represent a milk production per cow approximating 6000 lbs. This production is low when we consider the high priced land which the farmers of this Province are operating. If we set a minimum standard of milk production of say 300 lbs. of butter fat it means that the average production per cow must be raised by 65 lbs. This is not easily accomplished but it is one way by which increased business may be achieved on our dairy farms.

As would be expected the cost of feed per cow increased with the increased milk production. On the other hand the efficiency of the cows, as shown by the total digestible

nutrients fed for each pound of butter fat increased with the greater production. As the production of the cows increased a less amount of feed was required to produce a pound of butter fat. The whole credit for the greater production cannot be attributed to the increased feed. It will be noted that a greater percentage of the herds yielding the greatest production were headed by pure bred sires. This would indicate that the breeding of the herd played some considerable part. In order to show which of these two factors was of greatest importance in reducing the cost of production, Table No. 3 has been prepared from data secured on the crop year of 1920.

It is noted that in both the poor and good live stock groups the production efficiency decreased, or in other words, the number of total digestible nutrients required to produce one pound of butter fat increased with heavier feeding. Referring to Table No. 3 one sees that medium feeders of the poor livestock group and the good feeders of good livestock used fifteen total digestible nutrients to produce one pound of butter fat. The farmers who practised higher feeding did not get as satisfactory results in either the poor or good livestock groups, in

TABLE NO. 3.

Groups		Medium Feeding	Good Feeding	High Feeding
POOR LIVESTOCK	No. of farms	12	11	
	Average total digestible nutrients per animal unit	2,703	3,749	
	Average pounds butter-fat sold per cow	178	191	
	Average production efficiency of cows	15	19	
	Percentage of farmers who used a purebred sire five years and over	33	36	
	Average cost of producing butter fat allowing interest at 7%	\$1.30	\$1.41	
	Average cost of producing butter fat allowing no interest	0.82	0.92	
GOOD LIVESTOCK	No. of farms		22	18
	Average total digestible nutrients per animal unit		3,606	5,110
	Average pounds butter fat sold per cow		238	255
	Average production efficiency of cows		15	20
	Percentage of farmers who used a purebred sire five years and over		50	61
	Average cost of producing butter fat, allowing interest at 7%		\$1.07	\$1.13
	Average cost of producing butter fat, allowing no interest		0.64	0.75

that it took, respectively, nineteen and twenty total digestible nutrients to produce one pound of butter-fat. Table No. 3 shows that the good feeders of poor livestock and the high feeders of good livestock overfed their cows.

Though the farmers with good livestock fed more heavily than those with poor livestock, Table No. 3 shows that they produced their butter-fat more cheaply than either of the poor livestock groups.

The farmers who produced butter-fat at lowest cost were those who kept well-bred stock and practised good feeding methods.

Table No. 3 shows that higher feeding increased the amount of butter-fat sold per cow, but that increased feeding must be done with consideration of the production per cow.

Good cows will consume more feed, as is shown in Table No. 3, but returns justify the increase of feed, since production costs are lower than in the case of the poor livestock groups. Though the farmers who practised high feeding methods with good livestock did not secure as satisfactory results in feeding as did the good feeders of poor livestock, their production costs were lower. The loss through heavier feeding no doubt was more than made up by sale of young stock. Such sale was made possible from the fact that the higher production of the cows allowed the farmers to sell their young stock to good advantage, and thus reduce their production costs below that of the farmers who kept poor livestock and practised good feeding. It is generally recognized that increased feed-

ing of dairy cows may not be an improved method of feeding. Consideration must be given to the balance, the succulence, the variety, the palatability, the digestibility, and the bulkiness of the ration and to the individuality of the cow. Table No. 3 shows, then that heavier feeding increased production per cow, but that improved breeding of the herd had a much greater effect on reducing the cost of producing butter fat than had increased feeding.

Up to this point a few of the farmer's problems have been briefly commented upon. The large amount of capital necessary for the operation of a dairy farm has been commented upon. The large percentage of uncleared land has been mentioned. High capitalization coupled with a high interest rate makes necessary the development of a large sized business. The large sized business to be developed economically demands high producing stock economically fed. Scores of other problems might be mentioned as revealed by B. C. dairy farm surveys, but time does not permit of their discussion.

While some of these problems may be solved readily, many of them can only be solved slowly. I believe a great step in that direction will be through what has been observed as becoming more generally adopted and that is a simple set of farm books well kept.

These reveal to the farmer the magnitude and difficulties of his business, but along with the farm record should be a farm budget. When the farmer sees his own problem he is in a much better position to overcome difficulties.

Much has been written about the farmer working too much with his hands, yet little has appeared as a guide as to what definite work he might do to take the place of some of the hand-work. The great difficulty is to build up a sufficiently large business to reward him with a satisfactory labour and interest income. A plan of such a business placed on paper may be made at the beginning of the year. The farmer knows his average current expense such as taxes, wages, feed, blacksmith, etc. He knows his average receipts from various sources. The difference between the receipts and expenses should be sufficient to pay a satisfactory wage to the operator and interest on capital invested. Many errors due to miscalculation may appear in the first budget prepared. The budget will, however, be a guide and plan of operations for the year. Such a plan would add greatly to the joy of the business, would take only a few evenings during the winter months and would give each farmer a greater appreciation of the fascinating though difficult task of successfully operating a dairy farm.



Field of Oats in the New Agricultural Area of Northern British Columbia.

Culture and Agriculture.

By DR. H. ASHTON

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A professor of Latin in the University of Pennsylvania has just been visited by a brilliant idea. The result is an article in the *Educational Review* under the title "A Professorship in the Amenities of Life". The editor of the magazine says that this delightful essay will long be remembered by the readers of this review. It will certainly be remembered by one of the readers as the most damning indictment of educational work on this continent that he has yet seen. It will be remembered as a frank confession evidently supported by the Editor of an *Educational Review* that American education has failed in what I consider to be its chief function—the production of cultured men and women.

The reasons for this failure are not far to seek. The people of this continent discovered that they could work more quickly than people did elsewhere. The results might be somewhat slipshod, but they passed muster—they were good enough—they "would do". They promptly applied the system to education. Wise in their generation they had found the Royal Road to Knowledge—it was the shortest. They proceeded to cut out the dead wood, to add punch and 'pep', to specialize students scarcely out of their cradles, to show that learning was merely a tool with which to hew out a better and easier living than the other fellow could get. They cried to the masses "Come one, come all"—there is education for everyone, primary, secondary, university—no effort is needed—the taxpayer has a right to education without effort—education is not a luxury—it helps you to get a better job, bigger money—makes leaders—there is plenty of room at the top—and hundreds of other platitudes.

Then after many years of showing the other people how to put some pep into education there arises in Pennsylvania—in Pennsylvania, if you please,—the timid voice of a Professor—of what? of Pep?—no, of Latin, who suggests that a Professor be appointed to teach students the amenities of life, which is, being interpreted, to teach students to act like educated people.

In a recent article in *The Independent* a prominent banker of New York comes to the conclusion that no one who does not possess the personal elements of success in business can be assured of material success by the possession of a college education. He believes that liberal education secured in college or university is not designed for vocational purposes, although it may have a distinct influence and bearing on one's vocation. On the contrary, it is designed, he holds, for rather non-utilitarian purposes, if so-called "culture" may be regarded as non-utilitarian. "A man's inner life is at least as important to his happiness and to his ultimate value to mankind as his outer life." For this reason, he says, the chief purpose of a college education is to help one become ready "to live" in distinction from "making one's living".

So that short road has led into the desert, so the 'pep' has petered out, so the brightest in the land have the brilliant suggestion to go back to the beginning and learn as people learned in Europe, in back-number Europe, in fast-asleep Europe. Well, Well! Live and learn.

Culture, that much abused word, that much despised thing, is actually going to have a meaning again. It will become something distinct from snobbishness, something other than affectation—not a veneer added to life itself. Isn't that luck for Old Britain? Just like a lady with an old dress, who is so old-fashioned, so conservative, so back-numberish, that she keeps her old dress so long that it comes into fashion again. There's luck! Stupid old England, stupid old Scotland just kept on saying that culture was worth while, that education was not merely a short cut to financial success, that it was much more than this. Old fool Britain just kept right on wearing her old dress until—Luck!—Culture came into fashion again.

Meanwhile what had been happening among the clever boys? Primary education with reading, writing, and arithmetic, was not

good enough. Every parent was on the *qui vive* to add something that John or Mary might need when they went out to make a living.

Secondary Education goes faster still. A little Latin, a little French, perhaps some German, English of course, Science, naturally, Mathematics, surely—debates, sports, dances, meetings, committees, campaigns. Just time to snatch a little knowledge as it is carried past on a tray. Be sure to snatch just what you need and no more. Be sure to get the useful stuff—stuff you can turn into dollars and cents. Got to make a living, got to make it quickly.

Three years up! Time! Get out! "Excuse me—some of the best European schools cannot attain an adequate standard in these same subjects in less than six years, although they have been working at them for centuries, and have developed a highly trained corps of teach—" "Oh! forget it! You make me tired! No 'pep'! That's what's wrong with your old country schools. Half asleep!"

On to the University. Keep in mind that you have to make a living and take nothing that does not contribute directly to that end. As soon as possible specialize. Johnny decides to be a specialist in History. He will take French only in so far as it contributes to the study of History. Horrors! What is this he sees in his Second Year course? He is required to read a book by Anatole France? Not so sirrah! 'Odds boddikins, Sir Professor, I will have none of the imaginative writing of this sorry knave. I am a specialist in History. I would fain learn French in the pages of a History book, but other French will I not read—no by my halidame!

James has decided to be an Agronomist. He will learn French only in the pages of a book on Agriculture. Not for him the culture of the schools. He prides himself of his complete disregard of the amenities of life. When he invites the ladies to dance with him in a public hall he advertises the dance as a *Cow Hop*, and styles the hall a *barn*. This is the humour of the rustic and he is proud of it. He comes to the University to prepare himself for life on the land and he sees that life in terms of dollars and cents.

In Arts and Science, in Applied Science, the same process is going on. Some students ask unblushingly—"What use can I make of this?" i.e., How can I later exchange this for money?

If these men and women are going to live in towns they may be able, not to obtain happiness, for that is beyond hope, but to deaden their senses by frivolous pleasures or futile activities until the grim reaper comes and gathers them in. If they are going to live in the country they must later acquire the education they now scorn or they will infallibly lead unhappy lives and be of little use to the community. In short, I mean to present to you the seeming paradox, that, more than the student in Arts, more than the student in Science, the student in Agriculture needs a broad cultural training.

What do I mean by culture? Book knowledge? No.

"A cultivated mind," says Mill, "I do not mean that of a philosopher, but any mind to which the fountains of knowledge have been opened, and which has been taught in any tolerable degree to exercise its faculties—will find sources of inexhaustible interest in all that surrounds it; in the objects of nature, the achievements of art, the imaginations of poetry, the incidents of history, the ways of mankind, past and present, and their prospects in the future."

And that is all I suggest—that the agronomist should have a trained mind—not merely in the field of practical work, but also in that of thought and feeling.

Anatole France says somewhere that we are prisoners of our minds—that we cannot get out of ourselves, and that the tragedy of life is this inevitable imprisonment within ourselves. It is a tragedy for the city dweller with all the tinsel, all the noisy appeal of shallow amusements to attract his attention. It is a greater tragedy for the dweller in remote districts where the full weight of *ennui* falls upon the isolated mind. It is a tragedy, however, only if the mind is bare as a prison cell. It is no tragedy, but a great blessing, if the mind is furnished with Beauty of thought, of language, of colour. All the beauty of all the ages is ours to deck this prison if we would but forget from time to time that we have to earn a living and earn it quickly.

We wander in the fields and the very configuration of the country tells us the story of the anvient earth if we are versed in Geology. The field and garden are art-galleries and very wizards in showing us the processes of life if we have learned Botany. The meanest animal that scampers away at our approach can tell us of great wonders—if we have but some knowledge of Zoology. And, combining these lores, rising above them all, the world's literature makes the country-side a very delight, an open book of romance, an enchanted realm of pure delight.

We climb the hills and find mosses. They are interesting, perhaps, to the Botanist—of little import to the mere student of Agriculture, but beautiful indeed to your man of culture—not only by reason of his trained observation, but also because they open for him the gates of memory and he finds himself—out there under the sky with the mosses at his feet—quoting this passage of Ruskin:

"In one sense the humblest, in another they are the most honoured of the earth-children. Unfading as motionless, the worm frets not, the autumn wastes not. Strong in lowliness, they neither blanch in heat nor pine in frost. To them, slow-fingered, constant-hearted, is entrusted the weaving of the dark, eternal tapestries of the hills; to them, slow-pencilled, iris dyed, the tender framing of their endless imagery. Sharing the stillness of the unimpassioned rock, they share also its endurance; and while the winds of departing spring scatter the white hawthorn blossom like drifted snow, and summer dims on the parched meadow the drooping of its cowslip gold, far above, among the mountains the mosses rest on the stone, and the gathering stain upon the edge of yonder western peak reflects the sunsets of a thousand years."

If culture has been gained during the educative period, where is the sting of long winter evenings on the farm? The longer they are the better. No fear of being disturbed—no feverish town life to distract by its futilities. An arm-chair and a fire, and the whole world of thought and beauty, North, South, East and West in space, back to the ancients in time—All time, all space is yours. You can control the seasons.

Bring up April thus:

"When the clouds shake their hyssops, and the rain
Like holy water falls upon the plain,
'Tis sweet to gaze upon the springing grain
And see your harvest born.

And sweet the little breeze of melody,
The blackbird puffs upon the budding tree,
While the wild poppy lights upon the lea
And blazes 'mid the corn.

The skylark soars the freshening shower to hail,
And the meek daisy holds aloft her pail,
And Spring all radiant by the wayside pale,
Sets up her rock and reel.

See how she weaves her mantle fold on fold,
Hemming the woods and carpeting the wold.
Her warp is of the green, her woof the gold,
The spinning world her wheel.

By'n by above the hills a pilgrim moon
Will rise to light upon the midnight noon,
But still she plieth to the lonesome tune
Of the brown meadow rail.

No heavy dreams upon her eyelids weigh,
Nor do her busy fingers ever stay;
She knows a fairy prince is on the way
To wake a sleeping beauty.

To deck the pathway that his feet must tread,
To fringe the 'broidery of the roses' bed,
To show the Summer she but sleeps,—not dead,
This is her fixed duty.

Or May:

"The blackbird blows his yellow flute so strong,
And rolls away the notes in careless glee,
It breaks the rhythm of the thrushes' song,
And puts red shame upon his rivalry.
The yellowhammers on the roof tiles beat
Sweet little dulcimers to broken time,
And here the robin with a heart replete
Has all in one short plagiarised rhyme."

It is quite natural, also, for a country dweller to be interested in the lives of those who have preceded him in the country—to note the role of the farmer in fiction; to read the writings of men who have actually farmed, Richard Jeffries has a fine picture of the Old English farmer and I venture to quote it at length:

"They are not facile at expression, these same men of the soil. The flow of language seems denied to them. They are naturally a silent race—preferring deeds to speech. They

live much with inarticulate nature. It may be, after all, they have learnt some useful and abiding lessons from that intercourse. The old shepherds on the plains of Chaldea, under the starry skies of the East, watched the motions of those shining bodies till they slowly built up a religion, which, mixed with much dross, nevertheless contained some truths which educated men profess to this hour. These English farmers also observe the changes of the seasons, and watch the face of heaven. Their deepest convictions are not to be lightly set aside. There are men amongst them of great powers of thought. I remember one at this moment whose grand old head would have been a study for an artist. A large head he had, well-balanced, broad and high at the forehead, deep-set eyes, straight nose, and firm chin—every outward sign of the giant brain within. But the man was dumb. The thoughts that came to him he could communicate roughly to his friends, but the pen failed him. The horny hand which results from manual labour is too stiff to wield the swiftly-gliding quill. But there is another species of handwriting which will endure when the scribbings of the hour are utterly forgotten. This writing he laboured at earnestly and eagerly, not for his own good either, for it absorbed his own fortune, no small one, in the attempt to realize his conception of machinery which would double the yield of food. It has been done since his time, other men stepping over the bridge of experience which he had built. Now this man, who, on the principles of the opponents of the agriculturists, was a benefactor to his species, and a pioneer of true progress, was, nevertheless, one of the firmest, staunchest, most uncompromising supporters of that creed which they are endeavoring to destroy, and which may be stated thus: "I believe in the Sovereign, the Church, and the Land: the Sovereign being the father of the people in a temporal sense; the Church in a spiritual sense; and the Land being the only substantial and enduring means of subsistence. Cotton, coal, and iron cannot be eaten, but the land gives us corn and beef; therefore, the land stands first and foremost, and the agriculturist, as the tiller of the land, possesses an inalienable right which it is his duty to maintain, and in so doing he is acting for the good of the community. I believe that

the son and the daughter should obey their parents, and show regard to their wishes even when legally independent. Also that the servant should obey his employer. The connection between employer and employed does not cease with the payment of wages. It is the duty of the servant to show consideration for the advice of the master; and the master is not free from responsibility as to the education and the comfort of the man. The master is bound by all laws, human and divine, to pay a fair amount of wages for a day's work. If he does not do so he robs the workman as much as if he stole the money from his pocket. The workman is equally bound to do his work properly, and in neglecting to do so he robs his employer. To demand more wages than has been earned is an attempt at robbery. Both master and man should respect authority, and abide by its decisions."

This is good as far as it goes, but it does not go far enough. Add culture to this man's agriculture and simple faith—open the realms of thought and fancy, and a change comes over his life and over the country side.

Continue to furnish the prison cell of the mind, and then what a wonderful place is this mental chamber! No longer a prison, no longer a granary of dry agricultural facts and experiences like the mind of the uncultured expert, but a veritable palace of pleasure.

"I built my soul a lordly pleasure-house

Wherein at ease for aye to dwell.

I said, 'O Soul, make merry and carouse,

Dear Soul, for all is well."

Not as is Tennyson's poem, however, would such culture react upon a man. It does not make him selfish, does not blind him to the sufferings of his fellow man, but rather perfects and ripens him, gives him a great tolerance and a kindly patience—shows him the things that matter and those that are of little count in life, sends him out from time to time to help and minister, and keeps him ever ready and able to advise. Such a man is a real leader—not the noisy, obnoxious gas-bag who will be a leader whether his mother will let him or no, whether his fellows need him or no, but the quiet, wise director—the balance wheel of the whole community. And

in his heart and in his home is a great peace. Not the peace of ignorance and inertia, that can be scattered by a fall in the market, a bad crop, or a private bereavement, but the peace that passeth all understanding, because it is built upon understanding and rises above it.

But you will remark—"How can these things be?" All the advantages are on the side of the town-dweller. Those who live in the country must be behind the times from the very nature of their position. Towns are on the highroads of knowledge. The couriers pass through them before they come to the by-paths that lead past our farm.

That is true for the ignorant. It is not true for the educated. Nowadays the man of culture should be a product of the country—not of the town. Every influence that I see at work in town is contrary to real culture.

What, in fact, are the advantages of the town-dweller? Easy access to books, to theatres, to good music, to art—the possibility of refined conversation on things that matter.

Access to books? Why town dwellers have no time to read. Members of this, members of that, invited here, invited there, they shudder at the thought of spending an evening at home. They are bored with their own company and I do not wonder at it.

Theatres? The movies have sucked the life out of the theatres. Vancouver does not possess a theatre in which a modern play can be adequately staged.

Music? Wireless will bring it to your farm parlour.

Art—Town dwellers are interested in fads, but are little attracted by real art. A careful reader in the country—with the help of the modern colour process reproductions—could learn more of art than the town-dweller.

Theatres, movies, the scatter-brained babble of the townee who has no time to think, but who races through life like a puppy chasing his tail. Garish shops and flashing electric signs, while here in my farm I have just outside the door

The gleam

The light that never was on sea or land,
The consecration and the Poet's dream.

Advantages for my children!—What advantages? To be old before they have had time to be young? To be exposed to every

temptation? To see all that is superficial and tawdry and nothing that is sublime? To see everywhere the clumsy hand of man and never the master hand of God? Advantages forsooth! And after they have learned all of life's ugliness to have them pair off with people of the opposite sex for social or economic reasons instead of listening to the dictates of their hearts; to observe a girl less interested in whether a man really loves her, whether he will make a good husband—than in whether he is a Ford husband or a Pierce-Arrow husband.

For the country is not only the place for living, it is the place for loving—

The fountains mingle with the river
And the rivers with the ocean,
The winds of heaven mix for ever
With a sweet emotion.

Nothing in the world is single,
All things by a law divine
In one another's being mingle—
Why not I with thine?

And without this love a Pierce-Arrow income is as powerless as a Ford income to bring happiness to the home. And do not imagine that I speak for poetry alone. Culture is not all poetry. I began with poetry because it seems to have least to do with a farmer's life.

What of the study of economic questions in rural life, of folk-lore, of anthropology? Why not read travels, biographies, history—even Egyptology? The life story, the works of men like Fabre, the entomologist, read like novels. I mention novels—they are not to be despised—if they are worthy novels, carefully and thoughtfully read. Everything that will furnish the mind and beautify it, everything that will take the man away from the daily grind and open windows towards the world at large, everything that will prevent *ennui*—that grating pain known only to the mentally idle—everything that will bring healthy thought and therefore happiness—all these things are good and are necessary to the dweller in the country.

We must get back again to the real idea of culture and of books. The uneducated—or the partially educated—town-dweller imagines that he is a man of the world, that he meets people, that he is in touch with the heart of things. He affects to despise the

man who does not flit hither and thither along the Main Street, but who actually reads books. He speaks of him as a recluse—a man out of touch with the world—a man shut off from intercourse with his fellows. So speaks he in his folly.

While the town-dweller of this type sees faces and shakes hands, talks platitudes and sees but the outer form of men, the reader sees their hearts and souls. While the one meets a few men of this day, and knows them not, the other meets in books the men of all time, the best men of all time, and he knows them well for they lay bare the inmost recesses of their hearts.

The man who is in touch with the world is the man who reads, who takes time to think. In times of stress it is to him that men ever turn. The men of the world hurry to and fro like frightened sheep, but the man of knowledge comes forth with a sense of real values.

"For expert men can execute" wrote Francis Bacon, "and perhaps judge of particulars, one by one: but the general counsels and the plots and marshalling of affairs come best from those that are learned."

We have too many expert men, and far too many men who think they are experts. We need, and have not, men who are learned and they may be this while carrying on their daily work. "Crafty men condemn studies"

said Bacon, "Simple men admire them: and wise men use them: for they teach not their own use: but that is a wisdom without them and above them, won by observation."

If students will but acquire the habit of wide reading, the joy of thought for its own sake, they will find that life will be fuller, that life will be happier, and they will have more claim to the title of man. For the great danger is to go bustling through life without being in life, to have one's body everywhere present and one's spirit dead within it.

And now, If I have called you from what you consider the hard facts of life, to what you consider the mere babbling of a recluse, I crave your pardon, and put forward the lame excuse that I meant no harm, and that I am more than half convinced that truth is on my side and that truth is all that matters. Still if you count this truth to be but dreams, listen once more, and for the last time today, to the poet:

Had I the heaven's embroidered cloths,
Enwrought with golden and silver light,
The blue and the dim and the dark cloths
Of night and light and half light,
I would spread the cloths under your feet;
But I, being poor, have only my dreams;
I have spread my dreams under your feet:
Tread softly because you tread on my dreams.



Bulb Growing in British Columbia.

A Field of Tulips at the Experimental Farm, Vancouver Island.

The Relation of the District Supervisor of Agricultural Instruction to the Community.

A. M. McDERMOTT

District Supervisor of Agricultural Instruction, New Westminster, B.C.

The topic has suggested itself to me through association in work and recreation with many of you. We are a branch of a "society"; a society implies mutual, sympathetic understanding, and a contribution to facilitate that mutual good-will and close co-operation so helpful in any society, I have been glad to accept the invitation of our executive to speak to you on some of the more important features in the Relation of the District Supervisor of Agricultural Instruction to the Community. To his and your community, and not only the immediate geographical community; rather the entire social community.

This community involves the people in the respective districts, the teachers and pupils in the public and high schools, rural and urban; the Departments of the Government service, chiefly those of education and agriculture; the University, for many of those in our classes matriculate and proceed to the University; and all other organizations which in any way stand for community betterment.

I have now completed my third year in this service in British Columbia. It has been my privilege to assist in carrying out various schemes under the Agricultural Instruction Act in the provinces of Ontario, New Brunswick, Saskatchewan and in this province. The other three provinces may be considered fairly typical and representative of the work done throughout the Dominion, and I believe that the work in agricultural education in its aims and methods, in its far reaching influences, in the relation of these to the community as carried on in our own province, is second to none in the whole of the Dominion of Canada. It reflects great credit on the Director of this department of work and on the pioneers in the various districts. This I say in order that you may know that I have an implicit faith in my work; that makes work easier and more effective. "There can be no real relish, except when the appetite is keen.

If you will examine the courses of study as laid down by the Department of Education, you will find that proceeding to matriculation—the only complete course offered by a high school—there are in addition to other subjects, options in the sciences; physics, chemistry, botany and agriculture. A student proceeding to matriculation must take two or three of the sciences, depending on his choice of languages. This is, of course, the outline for the whole province. There are this year 457 students taking agriculture as a science option in the high schools of the province.

Now if you will again consult the outline of work in this subject as prescribed by the Department of Education, you will find that the work as set must of necessity be thoroughly practical in method of teaching and instruction. It is broad enough to embrace the agricultural activities of the whole province—in the main; it is particular enough to allow specialization where that is most closely related to and co-related with the agricultural interests of any district. As an option it is equally good for the student in the urban and in the rural classes, at least in this province.

There is no text-book in agriculture. In my opinion that is as it ought to be; but it is a matter of extreme concern to teachers who might, if they could, substitute a book for their own lack of experience in the subject content.

One of the commendable features in the organization of this work, is the fact that for final examination in the subject, 50% of the marks is given for the written paper; 50% for term work, instead of, as in all other subjects, a "snap verdict" and a pass or repeat as the case may be.

There are, then, 457 students in matriculation agriculture this year; in New Westminster, a city—and not part of Vancouver—there are 65 students in agriculture. I cannot speak for the remaining districts. True,

most of this number—nearly all—are in high schools where there is a District Supervisor, that is in the municipalities of Chilliwack, Langley, Surrey, Kelowna, Salmon Arm, and Penticton and Summerland (combined) but in Duncan and Victoria, and Armstrong graduates in agriculture are members of the high school staff and give instruction in that subject. Any other district might choose to take matriculation agriculture, but few if any do; which is as it ought to be.

There is no place in most of our high schools for vocational agriculture; that, I should say, is the place of the Faculty of Agriculture of the University, and only theirs, within its walls or by extension. None but the Department of Education is, or should be, doing the work which uses the subject as contributory to a general education, either by itself or in co-relation with the other subjects on the school program, or extending itself beyond the school to work with boys and girls in school or of school age in organized effort.

There is a very large place, indeed, to be taken by such organized efforts in projects of various kinds, but it must be well and carefully done.

Most District Supervisors are called upon to take charge of at least some other subjects on the school program, in most cases physics, chemistry, botany or general science. This, while taking much time which might be otherwise well spent, usually enhances his other efforts, puts him in more sympathetic touch with the teachers and students.

It must not be supposed that because of other requirements, the instruction in agriculture will fall down in its practical efforts. I hope you are all familiar enough with the work of district representatives to know that their serious concern is to make their practical work thoroughly up-to-date; experimental, observational; modern in method and information.

This I consider the most important phase of our work. But the course in elementary agriculture, or nature study—call it which you will according to the school of thought to which you belong—as prescribed for the public schools, takes the District Supervisor into all the classrooms on his district for supervision, and assistance in method and

information; most frequently for the giving of information on the various topics such as insects, livestock, bees, tree life, milk, soils, and what not. It is surprising how little teachers have of elemental knowledge on these matters of every day interest. Graduates of Universities and normal schools are by no means exceptions in this regard. Until these teachers are given that working knowledge of these subjects, they either dislike the work immensely and tell you so, or worse, pass it over entirely in their class work. Know the course of study and you will be convinced the fault is not in it. Just when you have her trained in these matters the teacher either marries the Supervisor or someone else and you begin all over again with the new teacher next term.

It is a matter of grave concern that little or no breadth of knowledge or appreciation of natural science is given to teachers in training in our normal schools. I am sure, from my experience, that teachers who have taught for some time in districts where a District Supervisor has been in close touch with their work, do much more thorough and conscientious work than those without any training.

This then is the major part of the District Supervisor's work. Many boys and girls never finish public school; few of the number who finish go to a high school; and few, indeed, of that number enter university or the College of Agriculture, so you must concede that if citizens in the making are to have an appreciation of, and an interest in agricultural problems; if they are to be actively sympathetic, far sighted, even tolerant, in that regard, much influence rests in the District Supervisor's field of effort. There are 10,000 pupils in schools of B. C. this year in more or less intimate contact with this influence. This fact needs no elaboration.

But the District Supervisor, if he is to succeed, must be a real community worker, and there are many lines of development in this regard. We should have very close relationship with the university, especially the Faculty of Agriculture. In the matter of the people to be reached by the two agencies there is very clearly a great work to be done in carrying university influence to the people with whom, from the nature of our work, we

are more closely in touch than they. Every District Supervisor gladly pays a tribute of esteem and loyal support to the Dean and faculty of the College of Agriculture for immeasurable assistance in a multitude of ways. Each man is just as certain as he is sincere that much helpfully influential work has been done in interpreting the College of Agriculture to the more distant people. In co-operation, there have been: distribution and testing out of good seed, stock and seed judging contests, lectures and demonstrations, of great value to those taking part. Some at least, through the pleasing flavour of agriculture in high schools, continue that study in a formal way in the College of Agriculture.

Many of the men have done very commendable and painstaking work in projects of various kinds, chiefly in co-operation with the Department of Agriculture in seed and livestock. My experience in this regard has been limited to poultry clubs. I submit that the relation of the District Supervisor to his Community would be greatly strengthened by an improvement in the handling of this all-important phase of effort. It has a very close relation to high and public school work, bringing the school and home interests nearer

together, and should, I believe, be organized solely with that in mind.

There is on the part of the District Supervisor, much other work done; some of it purely agricultural; much of it is just what any good citizen of a good community would give in service toward his ideal. Mentioned in brief as from the annual reports of the men in the various districts specialized efforts were as follows:—

Poultry and Livestock Club, Seed Clubs, Jersey Calf Clubs, Pig Clubs, excursions for special study of agricultural topics, school fairs, community picnics, short courses in agriculture for teachers or farm boys, Junior Stock Judging competitions at exhibitions, setting up District Exhibits at exhibitions, and assistance with conventions or gatherings of helpful value to the community. This does not take into account minor duties in which some of the men specialize.

Perhaps my random remarks have pointed out the fact that the District Supervisor in his place and work supplants and displaces no other department. His is an educational program working through the medium of agriculture. There can be no overlapping, no usurping of executive position, no divergence of efforts since the program is so clearly defined.



A Beautiful Lake in the Newly Opened up Section of Northern British Columbia.

Le Mouvement en Faveur de L'Amélioration de la Vie Rurale aux États-Unis (1).*

Par C. J. GALPIN

Économiste attaché à la "Division of Farm Population and Rural Life," Département fédéral de l'Agriculture.

Dans l'industrie agricole il y a trois principaux facteurs de l'organisation économique, de la production et de la distribution: la terre, le capital (plantes, animaux, outillage, etc.) et l'homme. Les connaissances agricoles se sont largement étendues aux États-Unis au cours de la dernière génération, par des recherches et des investigations concernant la terre, le capital, et quelque peu, quoique dans une moindre mesure, ces aspects du facteur humain qu'on nomme le travail agricole et l'administration de la ferme.

S'il existe quelque doute dans l'esprit des Américains sur la continuité du progrès de l'industrie agricole en Amérique—et je me refuse à admettre qu'il y ait des doutes sérieux à cet égard,—quelque léger doute, je le répète, qui semble exister parmi les populations agricoles de l'Amérique, ce doute porte, à mon avis, plutôt sur l'étendue de la capacité des êtres humains que sur la terre agricole ou les plantes, ou les animaux, ou le secours que les machines peuvent donner à la culture, ou même sur la population agricole envisagée au strict point de vue du travail agricole et de l'administration de la ferme. L'Amérique se trouve capable de résoudre le problème du sol, parce que certains de ses meilleurs esprits sont en train d'étudier ses sols. La présence de maladies des plantes ou des animaux ne l'alarme point, parce qu'elle a confiance dans les spécialistes qui recherchent et combattent ces maladies. La constitution d'un corps de connaissances exactes relativement à ces questions de l'agriculture américaine, par les méthodes plus rapides que l'expérience, est un des boulevards de la défense agricole nationale. Aucune occupation populaire ne plonge aussi profondément en Amérique dans les mystères de la science que l'agriculture.

Ignorance du facteur humain.—Mais sur ce point je dois m'arrêter pour confesser

qu'il y a eu dans le passé, en Amérique, une sérieuse lacune dans nos connaissances. Nous avons méconnu notre population agricole dans sa capacité d'êtres humains, quelque essentiel que soit dans l'agriculture le facteur humain. Pratiquement, les populations adonnées à l'agriculture ont été à bien des égards plus mystérieuses pour le public et même pour les économistes, que le blé, le coton, le bétail, l'argent ou les transports. Le fait est que tous les théoriciens de la science économiques ont trop posé en principe qu'il y avait un facteur humain, mais ce facteur demeure mythique et inconnu, à côté de ces facteurs étudiés et bien connus: la terre et le capital. Cette pratique s'est perpétuée en dépit de cette vérité que le facteur humain est si compliqué par les aspects que donnent à la nature humaine la mentalité, l'éducation, l'idéal, la vie sociale, que ce facteur ne peut être utilisé dans une théorie économique ou dans le commerce national, ou même dans la pratique politique, sans des données aussi exactes à son égard que celles qu'on possède sur la terre d'une part, ou sur le capital d'autre part.

C'est de la reconnaissance de cette lacune dans l'agriculture pratique et théorique qu'est né le mouvement pour l'amélioration de la vie rurale aux États-Unis. Le côté purement humain de l'agriculture, portant sur la vie et la manière de vivre, sur la consommation et les dépenses, aussi bien que sur la production et la distribution; sur la santé, le confort, le contentement, les facilités de jouir de tout ce qu'offrent les magasins des villes, des services de tout genre des hommes ou des

(1) De larges parties de cet article proviennent d'autres écrits de l'auteur, spécialement de son livre *Rural life* et du chapitre *Social Side of Farm Life* qu'il a écrit pour l'ouvrage *Agricultural Economics* de H. C. Taylor, édition de 1919.

*La Revue Internationale des Institutions Économiques et Sociales.

organisations, des possibilités ouvertes à la vie de l'esprit, voilà le centre d'intérêt de ce mouvement.

Je vais chercher à présenter le mouvement pour l'amélioration de la vie rurale aux États-Unis de manière à ce que lecteur comprenne mieux la situation historique qui a rendu ce mouvement nécessaire, à ce qu'il réalise mieux cet éveil de l'opinion conduisant à une nouvelle ère de développement agricole, à ce qu'il comprenne mieux les problèmes sociaux mis en lumière, à ce qu'il apprécie la naissance de la nouvelle science de la sociologie rurale, à ce qu'il soit au courant du nombre croissant de publications qui y sont consacrées, à ce qu'il reconnaisse les débuts des recherches sur les aspects humains de la vie rurale, et risque un regard sur la vie rurale et quelques prévisions sur les conditions d'existence de la prochaine génération.

1. Les Frontières de l'Agriculture Américaine et l'organisation du type des Frontières

La vie rurale en Amérique.—L'agriculture et la vie à la campagne n'ont point en Amérique ce long passé que comptent certaines races et certaines nations. Le fait que l'Angleterre a derrière elle 1.500 ans et la Chine des milliers d'années crée des différences dans leurs types d'organisation de la vie rurale, quand on les compare avec les 300 ans que compte l'Amérique; ces différences frappent autant que celles qui distinguent, l'homme mûr et le vieillard. Si l'on essaie de comprendre la vie rurale en Amérique, on ne peut surévaluer le caractère de spontanéité et l'absence de contrainte qui sont la marque du développement de cette vie, laquelle commence à la limite de la vaste plaine sur la côte de l'Atlantique, pour se continuer sur des terres nouvelles d'une étonnante fertilité, pratiquement à la disposition de l'agriculteur qui y creusait le premier sillon. Et cela est spécialement vrai quand on le rapproche et qu'on le compare avec la vie rurale d'autres peuples et d'autres races.

Déplacements de la ligne des frontières de 1790 à 1880.—Un des volumes du recense-

ment de la population des États-Unis en 1880 contient des cartes qui montrent les étapes successives de l'avance de la population à travers le continent américain, de l'est à l'ouest, de 1790 à 1880. La ligne qui va du nord au sud et marque la limite occidentale des terres contenant une population de moins de deux personnes par mille carré, ligne certes très irrégulière, comme vous pouvez l'imaginer, peut être considérée comme la frontière, la frontière de l'Amérique, où la famille rurale faisait face au désert et à la prairie et les soumettait avec la cognée et la charrue.

Ce qui caractérise la vie rurale américaine pendant ses 300 ans de développement, c'est la présence continue d'une nouvelle ligne frontière agricole et rurale. Là s'épanouissait l'esprit de conquête du pionnier agriculteur, et de là ce pionnier refluer sur la vie des agriculteurs des régions déjà colonisées un généreux courant d'épisodes d'endurance, d'aventures hardies, de vie et de pensée neuve. L'historien de l'Amérique a eu grandement raison de signaler tout ce que doit la démocratie américaine à cet apport continu, d'esprit de liberté et de vitalité, venant de la ligne mouvante des frontières sur les plus vieilles parties, les parties colonisées de l'Amérique. Je crois bien que, dans l'ensemble, la vie rurale américaine n'a pas moins profité que la démocratie américaine de l'influence vivifiante de ce même apport viril de la frontière.

Différences dans la rapidité du développement de la campagne et de la ville.—Durant les 300 années de mouvement et de développement de l'industrie, du gouvernement et de la vie en Amérique depuis la solitude des frontières successives jusqu'à la période de vie stable, dotée des exigences de la civilisation, la terre agricole et tout ce qu'elle requiert a de toute nécessité subi un développement beaucoup plus lent que la terre urbaine, entendue au sens le plus large de cette expression. Tandis qu'il suffit de quelques dizaines d'années pour soumettre la terre urbaine et l'adapter parfaitement aux besoins de la vie urbaine et de l'industrie, il faut des générations entières pour soumettre la terre agricole et l'adapter parfaitement aux besoins de l'agriculture et de la vie rurale. La main-

d'œuvre est toujours abondante pour soumettre la terre urbaine, tandis que la famille agricole s'assujettit sans l'aide d'autrui l'unité de terre agricole qu'elle détient.

Les bâtiments, les rues, les canalisations d'eau se construisent ou s'aménagent rapidement dans les villes, mais le défrichement d'une forêt ou la mise en culture d'un acre de terre agricole vierge demande du temps.

On ne s'étonne pas de trouver les communautés agricoles demeurer en arrière, dans les conditions retardées de la frontière, distancées par la civilisation urbaine en progrès, si l'on se représente soigneusement les difficultés matérielles qu'il y a d'adapter à une civilisation mouvante la terre agricole: exploitations, chemins et institutions.

Évolution des groupes agricoles depuis le stade des pionniers.—Un tableau graphique de ce qui est arrivé, humainement parlant, pas à pas, dans la vie agricole primitive de l'Amérique, nous permettrait, s'il pouvait être tracé, de voir comment cette vie a progressé, jusqu'aux groupes actuels de population rurale. Si nous pouvions remettre sous les yeux, comme dans un drame, la lente occupation du sol agricole, famille par famille, nous verrions étaient primitivement justifiés certains groupes de population rurale, certaines institutions, qui ont persisté jusqu'à nos jours avec moins de raisons d'être. Nous verrions le groupe politique local, comme la commune, émerger du chaos de familles rurales largement séparées. Ces familles ont besoin d'un gouvernement local. Ainsi l'organisation sans liens étroits des unités familiales locales sur une large étendue de terres suit naturellement. Rien de semblable à un village compact, à une ville ou cité n'était possible. Un moulin à blé sur un cours d'eau, une scierie peut-être, suffisait à déterminer l'établissement d'un groupe; autour d'un bureau de poste un autre s'établissait; une école, une église, quand l'occasion les requérait, et que la convenance et l'urgence l'exigeaient, en déterminaient d'autres. Un marché, qu'il s'agit d'un village ou d'une ville, groupait pour le commerce des agriculteurs qui pouvaient avoir appartenu à plusieurs groupe-

ments autour d'écoles différentes, ou à des groupements autour de deux ou plusieurs moulins différents. Les circonstances qui déterminaient le mélange de divers petits groupes de familles rurales continuaient d'abord d'agir pendant deux ou trois générations, jusqu'à ce que la coutume devînt établie et que l'acceptation générale de ces groupements devînt fixée dans la mentalité rurale et dans la mentalité urbaine. Les années et les générations s'écoulant, les agriculteurs qui s'étaient adaptés à l'organisation qui convient aux pionniers continuaient à se servir de cette organisation périmée, quelque incommode que ce fût et portaient en leur âme la peine de leur mauvaise adaptation.

Les progrès réalisés depuis le type de la frontière.—A moins que la communauté agricole américaine n'ait à souffrir un inévitable arrêt, et ne soit perpétuellement obligée de s'adapter à une organisation périmée, avec la résultante d'une infériorité sociale pour les agriculteurs actuels, les Américains doivent se préparer en esprit au stade final de la métamorphose de la communauté agricole passant de l'organisation de la frontière à l'organisation moderne. Ce stade peut être aussi dramatique que la métamorphose de la chenille en papillon. Quand la voiture sans chevaux ou le tracteur ont pris la place du cheval, personne ne demandait que le moteur inanimé eût l'apparence de l'animal qu'il remplaçait. Quand l'organisation moderne de la communauté supprime le type d'organisation de l'agriculture de la frontière, nous ne serons pas surpris de voir des changements complets dans la forme de l'organisation. Il ne faut pas confondre les nouvelles facilités commerciales avec un meilleur magasin à la croisée des routes, l'école moderne avec une petite école mieux bâtie, la nouvelle municipalité rurale avec une commune organisée plus efficacement. Tous ces progrès peuvent être réalisés sur des modèles entièrement différents. Nous devons chercher des formes d'organisation qui soient adaptées au développement économique et intellectuel des agriculteurs.

(à suivre)

Concerning the C.S.T.A.

NOTES.

Fred F. McKenzie (British Columbia '21) has been appointed Agent in Animal Husbandry, under the U. S. Bureau of Animal Industry, with headquarters at Columbia, Mo. He will be doing research work, chiefly with swine, on the relation of nutrition to fertility. His private address is c/o Y.M. C.A., Columbus, Mo.

G. D. Matthews (Macdonald '21) who has been with the Soldier Settlement Board at Quebec for the past two years, has recently been appointed to the staff of the Dominion Experimental Farm at Indian Head, Sask., as Assistant Superintendent.

J. E. Rettie (O.A.C. '12) who has become widely known as Secretary-Treasurer of the Guelph Winter Fair, and has been with the Live Stock Branch of the Ontario Department of Agriculture since 1912, is now in Manitoba. He has been appointed manager of the Manitoba Provincial Exhibition and also Manager of the Manitoba Winter Fair. His headquarters are at Brandon.

R. J. Reid (Macdonald '18) is now farming at Hemmingford, P.Q. Two other C.S.T.A. members also at Hemmingford are Charlie Petch (O.A.C. '12) and "Annie" Laurie (Macdonald '21).

C. H. Goulden (Saskatchewan, 1921) is taking graduate work in Plant Breeding at the University of Minnesota.

The following members have recently advised the General Secretary that they are taking graduate work:

C. E. Lampman (Wisconsin, '21) at Madison, Wis.

A. R. Ness (Macdonald '12) at Madison, Wis.

C. J. Watson (Macdonald '21) at Cornell.

G. F. H. Buckley (Alberta, '20) at Berkeley, Cal.

C. A. Lamb (British Columbia '21) at Macdonald College.

G. A. Richardson (O.A.C. '20) at St. Paul, Minn.

It is with the deepest regret that we record the death of Albert Edward Matthews, who died in a local hospital at Windsor, Ontario, on September 1st, 1923, in his thirtieth year. Death was due to "sleeping sickness."

'Bert' Matthews was a graduate of Macdonald College in 1920, and subsequently received his M.S. degree from the Iowa State College. He had recently been appointed to the staff of the Dominion Tobacco Station at Harrow, Ontario. For a time he was Field Supervisor in the Soldier Settlement Board at Vancouver. He had travelled extensively in Canada, the United States and Europe and had made a special study of Economics, Marketing and Co-operation.

Two of his brothers are in professional agricultural work in Canada—V. Matthews with the Dominion Experimental Farm at Lethbridge, Alberta, and G. D. Matthews, recently appointed to the staff of the Experimental Farm at Indian Head, Sask. To them and to other members of his family, the C.S.T.A. extends its deepest sympathy.

Trueman Stevenson (Saskatchewan, 1923) has been appointed Instructor in the Field Husbandry Department of the University of Saskatchewan.

Margaret Newton (Macdonald '18) has been appointed Assistant Professor of Biology at the University of Saskatchewan.

S. R. N. Hodgins (Macdonald '20) is becoming famous as a humorist. McClelland and Stewart, publishers, of Toronto, have just announced the publication of "Why Don't You Get Married?", by this author. Hodgins is the Editor of the Journal of Agriculture, and a C.S.T.A. booster. His first book is a series of humorous sketches, selling at \$2.00.